

A REVISION OF THE ORIENTAL SPECIES
OF *PALEXORISTA* TOWNSEND
(DIPTERA : TACHINIDAE, STURMIINI)



BY

R. W. CROSSKEY *rcf.*

Commonwealth Institute of Entomology, London.

Pp. 35-97 ; 79 *Text-figs.*

BULLETIN OF
THE BRITISH MUSEUM (NATURAL HISTORY)
ENTOMOLOGY

Vol. 21 No. 2

LONDON: 1967

THE BULLETIN OF THE BRITISH MUSEUM
(NATURAL HISTORY), *instituted in 1949, is
issued in five series corresponding to the Departments
of the Museum, and an Historical series.*

*Parts will appear at irregular intervals as they become
ready. Volumes will contain about three or four
hundred pages, and will not necessarily be completed
within one calendar year.*

*In 1965 a separate supplementary series of longer
papers was instituted, numbered serially for each
Department.*

*This paper is Vol. 21, No. 2 of the Entomological
series. The abbreviated titles of periodicals cited
follow those of the World List of Scientific Periodicals.*

*World List abbreviation :
Bull. Br. Mus. nat. Hist. (Ent.).*

© Trustees of the British Museum (Natural History) 1967

TRUSTEES OF
THE BRITISH MUSEUM (NATURAL HISTORY)

Issued 25 August, 1967

Price £1 5s.

A REVISION OF THE ORIENTAL SPECIES OF *PALEXORISTA* TOWNSEND (DIPTERA : TACHINIDAE, STURMIINI)

By R. W. CROSSKEY

CONTENTS

	<i>Page</i>
SYNOPSIS	37
INTRODUCTION	37
MATERIAL EXAMINED	39
TRIBAL DIAGNOSIS OF STURMIINI.	39
KEY TO THE GENERA OF STURMIINI IN THE ORIENTAL REGION	39
SYNONYMY AND DIAGNOSIS OF <i>Palexorista</i> TOWNSEND	42
TAXONOMIC CHARACTERS AND SPECIES-GROUPING	42
KEY TO THE ORIENTAL SPECIES OF <i>Palexorista</i>	45
DESCRIPTIONS OF THE SPECIES	49
SYNOPSIS OF THE ORIENTAL SPECIES OF <i>Palexorista</i> AND THEIR KNOWN HOSTS	87
REVIEW OF LITERATURE HOST RECORDS OF ORIENTAL SPECIES OF <i>Palexorista</i>	89
NOTES ON MIDDLE EASTERN SPECIES OF <i>Palexorista</i>	93
ACKNOWLEDGMENTS	95
REFERENCES	96

SYNOPSIS

The Oriental species of the genus *Palexorista* Townsend are fully revised, together with their host records. Keys to, and descriptions of, all species are given. Two new species are described, six specific names newly placed in synonymy and eleven lectotypes are designated. The tribe Sturmiini is diagnosed, and a key presented to the Oriental genera. Notes are included on Middle Eastern species of *Palexorista* that are closely allied to Oriental forms.

INTRODUCTION

PALEXORISTA Townsend is one of the commonest genera of Tachinidae in the tropical areas of the Old World, where many species are commonly reared parasites from lepidopterous pests of agricultural crops or timber-trees; some European species are parasites of Diprionid sawfly larvae and have been introduced to, and established in, North America for the biological control of spruce sawflies. Since the work of Mesnil (1949, 1951) the species of *Palexorista* have been placed in the subgenus *Prosturmia* Townsend of the genus *Drino* Robineau-Desvoidy, but it has now been shown (Crosskey, 1966) that *Prosturmia* is a synonym of *Palexorista* Townsend—which is based on a recent type-specimen in copal and not, as originally supposed, in Baltic amber. It is here preferred to treat *Palexorista* in generic status (not as a subgenus of *Drino*) for the reasons put forward in my earlier paper (Crosskey, 1966).

The present revision of the Oriental species of *Palexorista* covers New Guinea and Queensland as well as the Oriental Region proper, but excludes species from the Pacific islands (except for *P. solennis* which is an Oriental species occurring widely in the Pacific islands also). In the past there has been much misidentification of species from this area, and the literature of economic entomology therefore contains many erroneous host records, especially in the period 1932-40: at this time Oriental Tachinidae were identified for the Commonwealth [then Imperial] Institute of Entomology by Baranov, and many of the misidentifications in the literature are traceable to the fact that Baranov confused at least five species under the name *Sturmia inconspicuoidea* Baranov. In a later section the existing host records are reviewed with a note of their validity.

The hosts of *Palexorista* species in the Oriental and Australasian regions are largely army-worm and boll-worm larvae of Noctuid moths, and to a lesser extent the larvae of Pyralidae, many of which are major or minor pests of sugar-cane, maize, rice, tapioca, castor-oil plant, tobacco and other agricultural crops, or defoliators of oil-palm and coconut and of forest-timbers (particularly teak). No Hymenopterous hosts of *Palexorista* are known from the area. Baranov (1934a) recorded a specimen of *Palexorista* (identified by him as *inconspicuoidea*) as "Ex *Graeffea cocophaga* Newp." in Fiji: I have not seen the specimen referred to by Baranov, but the British Museum collection contains two specimens of *Palexorista*, also from Fiji, reared from *Graeffea crouanii* (Le Guillou) (of which *Graeffea cocophages* (Newport) is a synonym); this is a surprising host record, apparently valid, since *Palexorista* and related genera have not previously been known to parasitize Phasmida or any other orthopteroid orders.

Knowledge of the habits and development of Oriento-Australasian species of *Palexorista* is scanty, but some information has been provided by Cherian and Kylasam (1939) for an Indian species (misidentified as *inconspicuoidea*) and by Hoyt (1955) for *Palexorista aequalis* (Malloch) in Samoa.

As a result of the present revision nineteen species of *Palexorista* are recognized in the Oriental Region (including Queensland), of which two are new; twenty-five specific names, other than those of the new species, are involved in the revision and the holotypes or syntypes have been seen on which all but one of these names are based (the holotype of *dilaticornis* Mesnil is apparently lost: see discussion under this species).

It is possible that *Crossocosmia biseriata* Wulp, described by Wulp (1894) from a single specimen from India of doubtful sex, belongs in the genus *Palexorista* but I have been unable to confirm this: Dr. A. P. Kapur informs me that the holotype specimen is in the collection of the Zoological Survey of India in Calcutta, but that it cannot unfortunately be made available on loan because of its very poor condition. The type of *biseriata*, however, shows a single *ad* seta on the mid tibia, four sternopleural setae, some sparse hairs on the parafacials below the frontal setae, and no distinct ocellar setae (Kapur, personal communication), and these characters in combination leave little doubt that *biseriata* belongs in one of the Sturmiine genera of the *Drino*-group: it is impossible to infer sufficient from this and from Wulp's (1894) description and figures for reliable generic assignment.

MATERIAL EXAMINED

Types and other material have been studied from the following collections (abbreviations given are those used throughout the text in the lists of material examined):

Bernice P. Bishop Museum, Honolulu (Bishop Mus.); British Museum (Natural History), London (B.M. Nat. Hist.); Canadian National Collection, Ottawa (Can. Nat. Coll.); Naturwissenschaftlichen Museum der Coburger Landesstiftung, Coburg; Deutsches Entomologisches Institut, Eberswalde (D. Ent. Inst.); Rijksmuseum van Natuurlijke Historie, Leiden (Rijksmus. Leiden); School of Public Health and Tropical Medicine, Sydney (S.P.H.T.M. Sydney); United States National Museum, Washington (U.S. Nat. Mus.); Universitetets Zoologiske Museum, Copenhagen; Zoologisch Museum, Amsterdam (Zool. Mus. Amsterdam).

TRIBAL DIAGNOSIS OF STURMIINI

At the present time no universally agreed classification exists for the higher Tachinidae (here meaning the Exoristinae plus Goniinae), but the work of Mesnil (1944-65) on the Palaearctic fauna undoubtedly indicates the lines on which a world classification can be evolved and renders order out of the chaos of supposed tribal groups created by Townsend and elaborated in his Manual of Myiology (Townsend, 1934-42). The definition of satisfactory tribes in the vast complex of exoristine-goniine forms is difficult and workable diagnoses will have to be based on aggregates of many characters taken together. The diagnosis here presented for the tribe Sturmiini has been drawn up after study of material from all regions, but there is little doubt that the diagnosis now given may need later modification.

Tribe **STURMIINI** Robineau-Desvoidy

Sturmidæ Robineau-Desvoidy, 1863, *Hist. nat. Dipt. Env. Paris* 1 : 885.

Goniine Tachinidae with following combination of characters: Gena wider than profrons or at least subequal in width to profrons. Ocellar setae proclinate (sometimes absent). Upper frons with reclinate orbital setae, female never with outwardly-directed prevertical setae. Vibrissae almost always distinctly above mouth-margin. Parafacials usually bare, sometimes haired but without strong bristles. Arista only thickened basally. Humeral callus with four setae in a basal straight row of three with one set forward (rarely the single forward seta weak and hair-like). 3 + 4 dorsocentral setae. Pre-alar seta long and strong, longer than first posterior dorsocentral or intra-alar seta. Apical scutellar setae present, sometimes weak. First and fifth wing veins always bare. Cell R_5 open. Mid tibia with a ventral submedian seta, sometimes small. Hind tibia with a well developed close-set antero-dorsal fringe, less developed in female. Barettæ bare or haired anteriorly. Abdominal tergite 1 + 2 excavate to hind margin. Intermediate abdominal tergites almost always without discal setae. Female ovipositor not adapted for piercing. Male hypopygium with two pairs of parameres. Sixth abdominal tergite of male represented at most by two very weak dorsal sclerotizations. Inner margin of lower calypter closely abutting against scutellum.

KEY TO THE GENERA OF STURMIINI IN THE ORIENTAL REGION

Note: The following genera, placed by Mesnil (1949-52) in the Sturmiini, are here omitted as they do not belong in the tribe as here defined: *Aneogmena* Brauer & Bergenstamm, *Dolichocolon* Brauer & Bergenstamm, *Cadurcia* Villeneuve and *Mycteromyiella* Mesnil. Also omitted are *Tamaromyia* Mesnil (the single species of which occurs in the Oriental Region in Szechwan)

and *Koralliomysia* Mesnil (with a single species from India), as both these genera are unknown to me: *Tamaromyia* will probably run in the key to near *Calozenillia*, and *Koralliomysia* differs from all other Oriental sturmiine genera by the obliteration of the interfrontal area.

- | | | |
|----|--|--|
| 1 | Upper frons with two or three pairs of reclinate orbital setae | 2 |
| - | Upper frons with one pair of reclinate orbital setae (in ♂ well isolated, in ♀ sometimes preceded by a pair of very small setae ventrad and mesad of main pair) | 13 |
| 2 | Eyes densely hairy | 3 |
| - | Eyes bare or at most very sparsely and inconspicuously short-haired | 8 |
| 3 | Entire parafacials strongly haired. Two or three sternopleural setae, if three as in most females then arranged 1 + 1 + 1 | STURMIOPSIS Townsend |
| - | Parafacials bare. Four or three sternopleural setae, if three then arranged 2 + 1 | 4 |
| 4 | Facial ridges bristled or haired on more than half their length. Ocellar setae usually absent or very weak | 5 |
| - | Facial ridges bare (<i>i.e.</i> with only the usual few setulae immediately above the vibrissae). Ocellar setae strong, subequal in size to upper pair of reclinate orbital setae | 7 |
| 5 | Mid tibia with three or four <i>ad</i> setae. Sternopleural setae 2 + 1. Facial ridges visible in profile and armed with very strong setae. Scutellum with strong spiniform discal setae preapically. Interfrontal area much narrower than parafrontal | TAKANOMYIA Mesnil |
| - | Mid tibia with one submedian <i>ad</i> seta. Sternopleural setae 2 + 2. Facial ridges not visible in profile and at least uppermost setulae weak and hair-like. Scutellar hair not at all spiniform. Interfrontal area subequal in width to parafrontal | 6 |
| 6 | Basal node of R_{4+5} with one long strong curved seta. Facial ridges unusually flat and with long fine hair. Abdomen of ♂ thickly silvery white pollinose on most of T_3-T_5 | ISOCHAETINA Mesnil |
| - | Basal node of R_{4+5} with two to four small setulae, occasionally only one but if so small and inconspicuous. Facial ridges not unusually flat, with strong setulae on most of lower half and fine hairs only on upper part. Abdomen of ♂ not thickly and evenly silvery grey pollinose | PSEUDOPERICHAETA Brauer & Bergenstamm |
| 7 | Three sternopleural setae, 2 + 1. Apical scutellar setae strong and crossed but almost horizontal. Second arisal segment not noticeably elongate. Intermediate abdominal tergites usually with small discal setae distinguishable from the hair. Dorsum of thorax yellow pollinose with bold black vittae and black basal half of scutellum sharply demarcated from yellow apical half | CALOZENILLIA Townsend |
| - | Four sternopleural setae, 2 + 2. Apical scutellar setae strong and directed upwards, crossing usually in apical halves. Second arisal segment conspicuously elongate, three or four times as long as broad. Intermediate abdominal tergites without discal setae. Thoracic pattern normal, not unusually boldly black and yellow | PARADRINO Mesnil |
| 8 | Prosternum bare. Facial ridges strongly bristled. Mid tibia with three or four <i>ad</i> setae. Three sternopleural setae | BLEPHARELLA Macquart |
| - | Prosternum setulose. Facial ridges bare. Mid tibia usually with a single <i>ad</i> seta. Four sternopleural setae (except in <i>Thelairosoma</i>) | 9 |
| 9 | Three sternopleural setae, 2 + 1. Basal node of R_{4+5} with several small setulae. Fourth abdominal tergite of ♂ without secondary sexual hair-patches | THELAIROSOMA Villeneuve |
| - | Four sternopleural setae, 2 + 2. Basal node of R_{4+5} usually with a single setula (not in <i>Isosturmia</i>). Fourth abdominal tergite of ♂ usually with secondary sexual hair-patches or with hair of sides and venter of tergite in some way modified | 10 |
| 10 | Basal node of R_{4+5} with three or four small fine setulae. Vibrissae slightly above mouth-margin in ♂, about level with mouth-margin in ♀. Ocellar setae absent or | |

minute. Apical scutellar setae directed conspicuously upwards. Venter of fourth abdominal tergite of ♂ with very dense hair-patches of long convergent hair

ISOSTURMIA Townsend

- Basal node of R_{4+5} with one strong setula (very rarely accompanied by a minute supernumerary hair). Vibrissae usually well above mouth-margin in both sexes. Ocellar setae variable. Apical scutellar setae usually more or less horizontal or directed only slightly upwards 11

- 11 Ocellar setae very strong, subequal in size to reclinate orbital setae, inserted slightly in front of anterior ocellus. Mid tibia with two or one *ad* setae, if with one then hair of venter of fourth abdominal tergite of ♂ unmodified. Parafacials totally bare *ZYGOBOTHRIA* Mik

- Ocellar setae absent or very weak and much smaller than reclinate orbital setae, when present not inserted at all forwards of the anterior ocellus. Mid tibia always with one submedian *ad* seta in Oriental forms (more in European *Drino*). Parafacials bare or finely haired on upper parts 12

- 12 Parafacials completely bare. Ocellar setae absent. Each side of venter of fourth abdominal tergite of ♂ with unmodified hair or with a large area of short fine close-set hair not formed into a definite fascicle . . . *DRINO* Robineau-Desvoidy

- Parafacials finely haired on upper parts, hair sometimes extending on to lower parts, occasionally only a very few minute hairs immediately below lowest frontal setae but parafacials never entirely bare. Ocellar setae present, weak and wiry (*P. laetifica* exceptional and ocellar setae absent). Each side of venter of fourth abdominal tergite of ♂ with well defined hair-patch, usually large and dense with hairs very long and converging into distinct fascicle . . . *PALEXORISTA* Townsend

- 13 Scutellum with two or three pairs of preapical setae *TRIXOMORPHA* Brauer & Bergenstamm

- Scutellum with the normal single pair of preapical setae 14

- 14 Eyes densely hairy 15

- Eyes bare 16

- 15 Facial ridges strongly bristled up most of their length . . . *PALES* Robineau-Desvoidy

- Facial ridges bare except for the usual few setulae immediately above vibrissae *SISYROPA* Brauer & Bergenstamm [part]

- 16 Subapical scutellar setae exceptionally widely separated, distance between their bases much greater than that between subapical seta and basal seta of same side of scutellum. Apical scutellar setae very strong, as large as or almost as large as lateral scutellar setae. Four sternopleural setae. Parafacials totally bare. Sides of fourth abdominal tergite of ♂ with long dense hair *STURMIA* Robineau-Desvoidy

- Subapical scutellar setae not exceptionally widely separated, distance between bases at most only slightly exceeding and usually less than distance between subapical seta and basal seta. Apical scutellar setae usually much weaker than lateral setae. Three or four sternopleural setae, if ♂ with four then fourth abdominal tergite without dense hair laterally. Parafacials usually with at least a few hairs immediately below lowest frontal setae. Sides of fourth abdominal tergite of ♂ with or without dense hair 17

- 17 Sides of fourth abdominal tergite of ♂ with long dense hair which extends on to venter. Two or three sternopleural setae, ♀ occasionally with four. Vibrissae well above mouth-margin. Parafacial usually conspicuously haired immediately below frontal setae. Large forms, length 10–20 mm. *BLEPHARIPA* Rondani

- Sides and venter of fourth abdominal tergite of ♂ without long dense hair. Usually four sternopleural setae in both sexes. Vibrissae only a little above mouth-margin. Parafacial almost bare, at most only a very few inconspicuous hairs immediately below frontal setae. Smaller forms, length 5–10 mm. *SISYROPA* Brauer & Bergenstamm [part]

SYNONYMY AND DIAGNOSIS OF *PALEXORISTA* TOWNSENDGenus *PALEXORISTA* Townsend, 1921

Palexorista Townsend, 1921 : 134. Type-species: *Tachina succini* Giebel, 1862 [= *Masicera solennis* Walker, 1859], by original designation.

Sumatrodoria Townsend, 1927 : 64. Type-species: *Sumatrodoria summaria* Townsend, 1927, by original designation. (Synonymy by Crosskey, 1966 : 134)

Prosturmia Townsend, 1927 : 69. Type-species: *Prosturmia profana* Townsend, 1927 [= *Masicera solennis* Walker, 1859], by original designation. (Synonymy by Crosskey, 1966 : 134)

Genus of Sturmiini with combination of following characters: Eyes bare. Facial ridges bare. Interfrontal area well developed. Two pairs of reclinate orbital setae. Ocellar setae weak and wiry, much smaller than reclinate orbital setae, very rarely absent altogether. Parafacials finely haired on upper parts, at least near lowest frontal setae, sometimes sparsely haired on whole length. ♂ without proclinate orbital setae. Vibrissae well above mouth-margin (rare exceptions). Basal arisal segments not elongate, second arisal segment not exceeding twice as long as broad. Four sternopleural setae arranged 2 + 2. Two pairs of lateral scutellar setae. One pair of preapical scutellar setae. Apical scutellar setae not directed strongly upwards. Basal node of R_{4+5} with one strong setula (very rarely an additional supernumerary hair). Mid tibia with one submedian *ad* seta in most forms. Intermediate abdominal segments without discal setae. Venter of fourth abdominal tergite of ♂ on each side with secondary sexual hair-patch of long dense hair, usually forming a large tight fascicle.

Distribution. Widespread in most of the Old World, particularly in the tropical areas: absent from British Isles and New Zealand. (The closely similar and related genus *Zygoturmia* Townsend occurs in the New World and differs from *Palexorista* by having the parafacials entirely bare and only a single pair of lateral scutellar setae.) The European species *Palexorista bohémica* (Mesnil) is established in Canada, from Ontario to Newfoundland and Nova Scotia, by introduction.

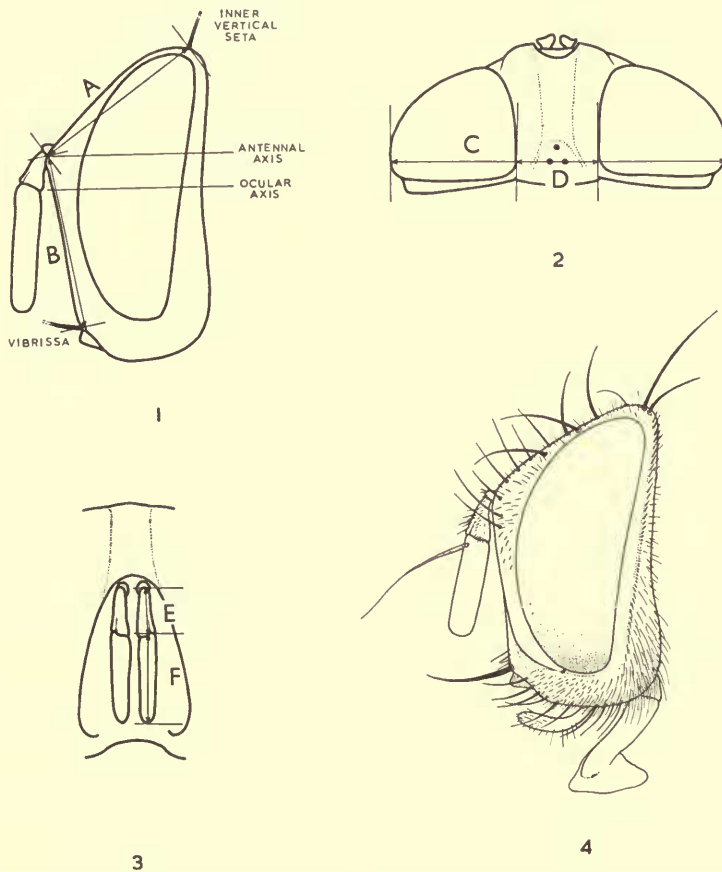
TAXONOMIC CHARACTERS AND SPECIES-GROUPING

The species of *Palexorista* are superficially much alike, especially in the female, and few can be reliably identified on external characters; the identity of most species must be confirmed on characters of the male genitalia, although several head characters and some abdominal characters are also useful (the only slightly useful characters on the thorax and its appendages are the colour of the mesonotal pollinosity and the length of the tarsal claws of the male).

The relative proportions of different head structures provide useful characters and the measurement points used for determining these are shown in Text-figs. 1-3. The following terms are used in descriptions of the head: *frontal length*, the distance measured in direct line with the head seen in profile from the base of the inner vertical seta to the lower basal point of the first antennal segment (measurement A in Text-fig. 1); *facial length*, the distance measured in direct line with the head seen in profile from the lower basal point of the first antennal segment to the base of the vibrissa (measurement B in Text-fig. 1); *antennal axis*, an imagined horizontal line through the head profile level with the lower basal point of the first antennal segment (*i.e.* the intersection point of the frontal and facial lengths); *ocular axis*, an imagined

horizontal line through the head in profile at the level of the eye-middle. In species of *Palexorista* the frontal length is always longer than the facial length when measured but it is important to note that the character is deceptive if not measured since in many species the facial length *appears* to be longer than the frontal length: the antennal axis is always above or at most level with the ocular axis, never below it.

Some species have the frons conspicuously wider than others, and frons-vertex width is remarkably constant within a species: the width of the vertex (D in Text-fig. 2) as a proportion of the total head-width (C in Text-fig. 2) provides a valuable character and one of the few of any use for recognizing the females of some species. Other head characters of some taxonomic value include the length of the third antennal segment relative to the second with the head seen in facial view (Text-fig. 3), the



FIGS. 1-4. 1-3, outline drawings of head and antennae of *Palexorista* in 1, profile, 2, dorsal view and 3, facial view showing measurement points used for determining proportions of head structures: (A) frontal length, from inner vertical seta to first antennal segment; (B) facial length, from first antennal segment to vibrissa; (C) head-width; (D) width of vertex; (E) length of second antennal segment; (F) length of third antennal segment. 4, Head of female of *Palexorista* in profile showing fine hairing of upper parafacial.

parafrontal colour, width of interfrontal area, extent of hairing on the parafacials, and the presence or absence of a row of black occipital setulae behind the postocular row (this last character requires caution as species normally possessing such setulae may occasionally have only one or two haphazard setulae or even none at all in some specimens).

Apart from the male genitalia, the most useful abdominal character is the size and form of the dense paired secondary sexual hair-patches on the venter of the fourth abdominal tergite (T₄); some species are at once identifiable in the male if the hair-patches are exceptionally large or small, or the hairs less bunched than usual. Distribution of the abdominal pollinosity and the abundance of recumbent hair dorsally on T₄ are of minor taxonomic value.

The male genitalia provide the most useful of all characters, the form of the apical part of the aedeagus (distiphallus) distinguishing the species into two main groups (see below), and the exact shape of the paralobes and mesolobes when seen exactly in profile or posterior view providing excellent specific characters; in some species the normal short fine hairs towards the apices of the paralobes are developed into short stubby black setulae (referred to in the descriptions as apical spinules), the development of which appears to be constant for the species. No useful characters have been discerned in the hypopygial parameres, although such may exist if these structures are later examined in more detail.

The species of *Palexorista* fall into two main groups on the basis of the aedeagus: in some species the distiphallus is distinctly bilobed when seen in profile (Text-figs. 29-31), but in others there is no largely membranous posterior lobe or only a very weakly developed trace of one (Text-figs. 32-36); in the descriptions that follow the two types of aedeagus have been referred to as "bifurcate" or "non-bifurcate" respectively. The differences in the aedeagus are associated with other reasonably constant features and two groups of species can be moderately well defined as follows:

Group I: distiphallus of aedeagus of bifurcate type (Text-figs. 29-31). Paralobes of male hypopygium usually with apical spinules. Frontal length (δ) 1.04-1.12 times as great as facial length (except *inconspicuides*, about 1.22). Antennal axis much above ocular axis. Male abdomen almost always with a pair of strong setae apically on sternite 4 and with a long strong seta on each lobe of sternite 5.

Group II: distiphallus of aedeagus of non-bifurcate type (Text-figs. 32-36). Paralobes of male hypopygium without apical spinules. Frontal length (δ) 1.19-1.30 times as great as facial length. Antennal axis usually not much above ocular axis or even level with it. Male abdomen usually without strong apical setae on sternite 4 and usually only with hairs on lateral lobes of sternite 5.

Group I includes *P. inconspicuides* (Baranov), *P. laetifica* (Mesnil), *P. laxa* (Curran), *P. lucagus* (Walker), *P. munda* (Wiedemann), *P. solennis* (Walker) and *P. subanajama* (Townsend) from the Oriental Region: it undoubtedly includes also *P. aequalis* (Malloch) from Samoa, *P. imberbis* (Wiedemann) and *P. zonata* (Curran) from Africa and several other African species.

Group II is less uniform than Group I and the species fall into some rather weakly defined sub-groups:

Mesolobes and paralobes of male hypopygium unusually short and broad, mesolobes in posterior view subtruncate: sub-group including *P. immersa* (Walker), *P. summaria* (Townsend) and *P. ophirica* (Walker). *P. bisetosa* (Baranov) perhaps belongs in this sub-group.

Mesolobes tapering in profile and with rounded apices in posterior view, paralobes slender and narrower than mesolobes in profile. Tarsal claws of male very small, shorter than last tarsal segment. Palpi more or less entirely yellow: sub-group including *P. painei* (Baranov), *P. sororcula* (Mesnil) and *P. parachrysops* (Bezzi).

Mesolobes in posterior view acuminate or rounded at the tips. Tarsal claws of male long. Palpi not entirely yellow. Antennae of male short: sub-group including *P. curvipalpis* (Wulp) and *P. deducens* (Walker).

Mesolobes in profile very much longer than paralobes (Text-fig. 54), in posterior view shaped as in Text-fig. 70. Tarsal claws of male long. Antennal axis conspicuously above ocular axis: sub-group including *P. bancrofti* sp. n.

The affinities of *P. dilaticornis* (Mesnil) and *P. reclinata* sp. n. are very uncertain and these species are not assignable to any of the groups or sub-groups outlined above.

KEY TO THE ORIENTAL SPECIES OF *PALEXORISTA*

(a) MALES

The following key includes all known Oriental species except *P. dilaticornis* (Mesnil), of which the male holotype is apparently lost and no other male material is known.

- 1 Frons without reclinate setae in addition to the two normal pairs of reclinate orbital setae. Gena slightly wider than or subequal in width to profrons. Vibrissae inserted well above mouth margin. Paralobes of hypopygium in posterior view not strongly convex 2
- Frons with a pair of strong reclinate setae below the normal two pairs of reclinate orbital setae (Text-fig. 78). Gena slightly narrower than profrons. Vibrissae inserted only very slightly above mouth margin. Paralobes of hypopygium in posterior view strongly convex (Text-fig. 79). [southern India]
 - 2 Aedeagus in profile distinctly bifurcate (Text-figs. 29-31), with a posterior lobe strengthened by sclerotization. Mesolobes of hypopygium pointed-acuminate apically (Text-figs. 55-61). Head profile with antennal axis conspicuously above ocular axis and frontal length 1.04-1.12 times as great as facial length (about 1.22 in *inconspicuooides*) 3
 - Aedeagus in profile not bifurcate (Text-figs. 32-36), if with slightly developed posterior lobe this almost entirely membranous. Mesolobes of hypopygium less acuminate (except in *curvipalpis*), tips usually rounded or subtruncate (Text-figs. 64-71). Head profile with antennal axis only slightly above ocular axis and frontal length 1.19-1.30 times as great as facial length 9
- 3 Hair-patch of T₄ unusually small (Text-fig. 23), sometimes almost obliterated, only about half as long as tergite and area of tergite basad of patch with normal hairing. Paralobes without apical spinules. Paralobes and mesolobes as in Text-figs. 43 and 60. [widespread from India to Tonga] *P. solennis* (Walker) (p. 57)
- Hair-patch of T₄ large, more than half as long as tergite and area of tergite basad of patch devoid of normal hairing. Paralobes with small stubby apical spinules (except in *laxa*). Paralobes and mesolobes not as in Text-figs. 43 and 60 4

- 4 Frons unusually wide, vertex 0.32-0.34 of head-width. Paralobes without apical spinules (Text-fig. 44). [Eastern Africa, India] *P. laxa* (Curran) (p. 62)
- Frons narrower, vertex 0.24-0.28 of head-width. Paralobes with apical spinules (Text-figs. 37-42) 5
- 5 Hair-patch of T₄ enormous, covering most of ventral surface of tergite (Text-fig. 24). Second antennal segment unusually long and third segment only about 2.4 times as long as second. Paralobes and mesolobes as in Text-figs. 38 and 56. [West Pakistan to New Guinea] *P. lucagus* (Walker) (p. 53)
- Hair-patch of T₄ of usual size (Text-fig. 28). Third antennal segment 2.4-3.8 times as long as second segment. Paralobes and mesolobes not as in Text-figs. 38 and 56 6
- 6 Ocellar setae absent or at most minute hair-like. Abdominal ground colour conspicuously red antero-laterally. Parafacial wider than third antennal segment. Paralobes and mesolobes as in Text-figs. 42 and 59, paralobes in profile very broad basally. Vertex wider, 0.27-0.28 of head-width. [Ceylon]
- P. laetifica* (Mesnil) (p. 49)
- Ocellar setae present. Abdominal ground colour not noticeably reddish basally. Parafacial subequal in width to or narrower than third antennal segment. Paralobes and mesolobes not as in Text-figs. 42 and 59, paralobes in profile more slender. Vertex usually narrower, 0.24-0.27 of head-width. 7
- 7 Facial profile long, frontal length about 1.04 times the facial length. Antennae long, third segment 3.0-3.8 times as long as second segment. Paralobes and mesolobes elongate, as in Text-figs. 37 and 55. [Malaya to Queensland and Solomon Islands]
- P. subanajama* (Townsend) (p. 55)
- Facial profile shorter, frontal length 1.12-1.22 times the facial length. Antennae short, third segment 2.4-2.7 times as long as second segment. Paralobes and mesolobes shorter, not as in Text-figs. 37 and 55 8
- 8 Upper occiput with an irregular row of black setulae. Distinctly yellowish pollinose on thorax and abdomen. Hypopygium with mesolobes rather broad in profile and paralobes not noticeably angled and tapering (Text-fig. 41). [Formosa]
- P. inconspicuoides* (Baranov) (p. 50)
- Upper occiput without black setulae behind postocular row. Greyish or pale yellowish grey pollinose on thorax and abdomen. Hypopygium in profile with mesolobes more slender, paralobes distinctly angled medially and more tapering on terminal part (Text-fig. 40). [India] *P. munda* (Wiedemann) (p. 52)
- 9 Outer vertical setae well developed. Claws very small and much shorter than fifth tarsal segment. [Formosa] *P. bisetosa* (Baranov) (p. 67)
- Outer vertical setae undeveloped, hair-like and hardly distinguishable from uppermost setulae of postocular row. Tarsal claws long, subequal to or longer than last tarsal segment (except in *painei* and *sororcula*) 10
- 10 Mesolobes shaped as in Text-figs. 48 and 71. Frons narrow, vertex 0.23-0.25 of head-width. Antennae very short, third segment 2.0-2.2 times as long as second segment. Puparium with strongly serpentine spiracular slits. [Celebes, Buru]
- P. deducens* (Walker) (p. 76)
- Mesolobes differently shaped. Frons wider, vertex 0.26-0.33 of head-width. Antennae longer, third segment 2.6-3.3 times as long as second segment (except in *curvipalpis*, 2.1-2.4). Puparium with simple or at most slightly sinuous spiracular slits (not known for all species) 11
- 11 Paralobes of hypopygium much shorter than mesolobes (Text-fig. 54), mesolobes of unusual shape in posterior view as in Text-fig. 70. Head profile as in Text-fig. 22. Hairing of T₄ and T₅ unusually long and fine. [Queensland]
- P. bancrofti* sp. n. (p. 85)
- Paralobes of hypopygium subequal in length to mesolobes (Text-figs. 49-52), at most only slightly shorter (Text-fig. 53). Hairing of T₄ and T₅ not unusually long and fine 12

- 12 Paralobes slender, narrower than mesolobes in profile (Text-figs. 51-53). Mesolobes with rounded or slightly pointed tips (Text-figs. 67-69). Tarsal claws small, shorter than or subequal to last tarsal segment. Palpi yellow, at most slightly darkened at extreme base. Third antennal segment 2.6-2.8 times as long as second segment, and extensively reddish orange basally and on inner edge 13
- Paralobes broad, subequal in width to or wider than mesolobes in profile (Text-figs. 46-47, 49-50). Mesolobes subtruncate apically (Text-figs. 64-66), except in *curvipalpis*. Tarsal claws long, length exceeding that of last tarsal segment. Palpi brownish with pale tawny apices. Third antennal segment either relatively shorter (2.1-2.4 times second segment) or longer (3.0-3.3 times second segment), usually entirely blackish brown, at most only narrowly reddish orange at extreme base 15
- 13 Paralobes and mesolobes as in Text-figs. 52 and 68. Parafrontals pale golden to golden orange pollinose against interfrontal and pale silvery yellowish towards eyes. Upper occiput without black setulae behind postocular row. About five or six pairs of cruciate frontal setae. T₄ with sparse long strong hair in only about three or four series. Hair-patch of venter of T₄ large and loose with tips of hairs overlapping edge of tergite (Text-fig. 25). [India, Ceylon, Malaya]
- P. parachrysops* (Bezzi) (p. 78)
- Paralobes and mesolobes differently shaped. Parafrontals unicolorous or more golden on upper parts only, not yellow or golden just along the rows of frontal setae. Upper occiput with black setulae behind the postocular row. About seven to ten pairs of cruciate frontal setae. T₄ with shorter more dense and fine hair in about five to seven series. Hair-patch compact as in Text-figs. 27 and 28 14
- 14 Mesolobes long, in posterior view open slit between tips much shorter than fused part (Text-fig. 67). Paralobes longer and more slender (Text-fig. 53). Vertex 0.32 of head-width. Parafrontals all greyish pollinose. Greyish pollinose species with mainly dark abdominal ground colour. Hair-patch of T₄ very similar to that of *curvipalpis* (Text-fig. 28). [Queensland] *P. sororcula* (Mesnil) (p. 83)
- Mesolobes short, in posterior view open slit between tips subequal in length to fused part (Text-fig. 69). Paralobes shorter and relatively broader (Text-fig. 51). Vertex 0.27-0.29 of head-width. Parafrontals pale yellow to golden on upper two-fifths and contrasting with more silvery lower parts. Golden pollinose species with mainly reddish orange abdominal ground colour. Hair-patch of T₄ smaller (Text-fig. 27), less than half width of tergite venter. [Java]
- P. painei* (Baranov) (p. 81)
- 15 Mesolobes pointed-acuminate in posterior view (Text-fig. 63). Upper occiput without black setulae behind postocular row. Parafacial nearly bare, usually only one or two very minute hairs immediately below lowest frontal seta. Antennae short, third segment 2.1-2.4 times as long as second segment. Head profile with unusually strongly convex frons (Text-fig. 15). Head almost always entirely silvery grey pollinose. [Ceylon to Queensland] *P. curvipalpis* (Wulp) (p. 68)
- Mesolobes subtruncate apically in posterior view (Text-figs. 64-66). Upper occiput with black setulae behind postocular row, sometimes very few. Parafacial distinctly haired on uppermost fifth or quarter, sometimes more. Third antennal segment 3.0-3.3 times as long as second segment (except in *ophirica*). Frons less strikingly convex. Head sometimes pale yellowish pollinose, at least parafacials usually silvery 16
- 16 Antennae short, third segment 2.3-2.4 times as long as second segment. Mesolobes very long and narrower in profile (Text-fig. 47). Vertex 0.26-0.28 of head-width. [Malaya and Java] *P. ophirica* (Walker) (p. 70)
- Antennae long, third segment 3.1-3.3 times as long as second segment. Mesolobes short and very broad in profile (Text-figs. 49 and 50). Vertex 0.28-0.31 of head-width 17

- 17 Mesolobes in posterior view as in Text-fig. 65. Hair-patch of T₄ larger, similar to that of *curvipalpis* (Text-fig. 28). [Formosa, Celebes, New Guinea] *P. immersa* (Walker) (p. 72)
- Mesolobes in posterior view as in Text-fig. 66. Hair-patch of T₄ smaller and very compact (Text-fig. 26). [Sumatra] *P. summaria* (Townsend) (p. 74)

(b) FEMALES

Females of the species of *Palexorista* are often very alike and offer few really satisfactory key characters; the following key should help in distinguishing the species for which the females are known, but must be used with caution. The female is not yet known of *P. bisetosa*, *P. deducens*, *P. ophirica*, *P. reclinata*, *P. sororcula*.

- 1 Upper occiput without black setulae behind postocular row, rarely with one or two isolated dark setulae 2
- Upper occiput with a distinct irregular row of black setulae behind the postocular row 8
- 2 Head in facial view with inner margins of eyes strikingly concave (Text-fig. 76), area between eyes widest at about mid height. Interfrontal area much narrower than a parafrontal. Palpi yellow. Base of third antennal segment extensively reddish orange. Fourth abdominal tergite with only about four series of hairs *P. parachrysops* (Bezzi) (p. 78)
- Head in facial view with inner margins of eyes not distinctly bowed medially, area between eyes widest near vibrissal level (Text-fig. 77). Interfrontal area subequal in width to parafrontal or only slightly narrower. Palpi brownish basally and tawny on expanded tips. Third antennal segment usually all blackish brown. Fourth abdominal tergite usually with about six to eight hair series 3
- 3 Frons exceptionally wide, vertex 0.35–0.37 of head-width. Parafacial wider than third antennal segment. [Eastern Africa, India: parasite on *Heliothis*] *P. laxa* (Curran) (p. 62)
- Frons not strikingly wide, vertex 0.28–0.33 of head-width. Parafacial narrower than or subequal in width to third antennal segment, sometimes very slightly wider. [not African, not known ex *Heliothis*] 4
- 4 Second antennal segment unusually long relative to third, third segment only 1.9–2.2 times as long as second segment. Small species, length usually about 6 mm. [Ceylon to New Guinea] *P. lucagus* (Walker) (p. 53)
- Second antennal segment not noticeably long compared to third, third segment 2.2–2.8 times as long as second segment. Larger species, usually 7.5–10 mm. 5
- 5 Vertex 0.28–0.29 of head-width. Parafrontals pale yellowish to golden pollinose and contrasting with silvery parafacials. Noticeably yellowish pollinose species. [Sumatra to New Guinea and Queensland] *P. subanajama* (Townsend) (p. 55)
- Vertex 0.30–0.32 of head-width. Parafrontals and parafacials more or less unicolorous pollinose, or if parafrontals more yellowish than parafacials then usually not noticeably contrasting 6
- 6 Parafacials yellowish white and parafrontals pale yellowish pollinose, head pollinosity not noticeably silvery. Antennal axis far above ocular axis. [southern India] *P. munda* (Wiedemann) (p. 52)
- Parafacials and parafrontals, especially the former, silver or silvery grey pollinose, parafrontals rarely slightly yellowish. Antennal axis not obviously far above ocular axis 7
- 7 Antennae shorter, third segment only 2.2–2.4 times as long as second segment. [Ceylon to Queensland] *P. curvipalpis* (Wulp) (p. 68)
- Antennae longer, third segment 2.6–2.8 times as long as second segment. [known from Formosa, Celebes, New Guinea] *P. immersa* (Walker) (p. 72)

- 8 Parafrontal about 1.6 times as wide as interfrontal area at level of lower proclinate orbital seta. Most of abdomen with reddish orange ground colour, especially T₅, the pollinose areas bright golden. Thoracic pollinosity distinctly golden yellowish. Upper parts of parafrontals pale yellow to golden and contrasting with more silvery pollinose lower parts of parafrontals. Palpi yellow, indistinctly darkened at extreme base. [Java] *P. painei* (Baranov) (p. 81)
- Parafrontal at level of lower proclinate orbital seta subequal in width to or only a little wider than interfrontal area. Abdomen with mainly blackish ground colour, sometimes reddish antero-laterally, pollinosity not bright golden. Thoracic pollinosity greyish to pale yellowish, usually not conspicuously golden. Parafrontals more or less unicolorous. Palpi dark brownish basally and paler tawny on expanded tips 9
- 9 T₅ with the usual well developed discal setae. Third antennal segment blackish brown. T₄ dorsally with about eight or nine hair series 10
- T₅ with discals represented by long fine hairing, without strongly developed discal setae. Third antennal segment extensively reddish orange. T₄ dorsally with about eight or nine hair series, the hair finer than usual. [Queensland] *P. bancrofti* sp. n. (p. 85)
- 10 Antennae very heavy, third segment 3.6 times as long as second segment and conspicuously broader than parafacial. [India] *P. dilaticornis* (Mesnil) (p. 65)
- Antennae not unusually heavy, third segment 2.2–3.2 times as long as second segment and not noticeably wider than parafacial 11
- 11 Ocellar setae absent, occasionally a minute seta on one or both sides. Abdomen with distinct reddish ground colour antero-laterally. Third antennal segment 2.4–2.7 times as long as second segment. [Ceylon] *P. laetifica* (Mesnil) (p. 49)
- Ocellar setae present. Abdominal ground colour entirely blackish. Third antennal segment usually either relatively longer or shorter 12
- 12 Antennae short, third segment about 2.2 times as long as second segment. Vertex 0.32 of head-width. Parafacial with only very few hairs confined to uppermost fifth or quarter. Antennal axis not obviously well above ocular axis. [Formosa] *P. inconspicuoides* (Baranov) (p. 50)
- Antennae longer, third segment 2.6–3.2 times as long as second segment. Vertex narrower, usually 0.29–0.30 of head-width (range 0.28–0.31). Parafacial with the fine hairs on uppermost third or half. Antennal axis conspicuously above ocular axis. [widespread in Oriental Region to Queensland and Pacific islands] *P. solennis* (Walker) (p. 57)

DESCRIPTIONS OF THE SPECIES

Palexorista laetifica (Mesnil, 1951)

(Text-figs. 9, 42, 59)

Drino laetifica Mesnil, 1951 : 190. Holotype ♂, CEYLON. In British Museum (Natural History), London. [Examined]

Palexorista laetifica (Mesnil) Crosskey, 1966 : 136.

♂. Head profile as in Text-fig. 9, frontal length about 1.09 times as great as facial length, antennal axis conspicuously above ocular axis. Vertex 0.26–0.28 of head-width. Ocellar setae usually completely absent, sometimes small hair-like setae present on one or both sides. Upper occiput with irregular row of black setulae behind postocular row. Interfrontal area subequal in width to parafrontal or very slightly narrower. Parafrontals mainly clear pale yellow pollinose, lower ends of parafrontals more creamy whitish pollinose especially against eyes, general yellow colour of parafrontals contrasting with silvery white or creamy whitish pollinose face and parafacials. Parafacial obviously broader than third antennal segment, with sparse fine hairs

on upper half, sometimes lower halves of parafacials also with a few small hairs. Antennae of medium length, third segment 2.4–2.7 times as long as second segment and entirely black-brown. Palpi brownish basally with extensively yellow tips. Mesonotum pale yellow pollinose, giving species a distinctly yellowish appearance to naked eye. Tarsal claws long. Abdomen with blackish brown ground colour medially but extensively reddish orange antero-laterally, fifth tergite also usually rather reddish, pollinosity pale greyish yellow and with rather shifting appearance, T₃ and T₄ both broadly black on hind margins to naked eye, the dark hind margin of T₄ occupying about two-fifths of tergite length. Median marginal setae of T₃ and marginal row of T₄ rather short and stubby; T₄ dorsally with about eight or nine hair series; discal setae of T₅ short and strong. Hair-patches of T₄ venter very large, similar to those of *curvipalpis* (Text-fig. 28). Genitalia: aedeagus of bifurcate type; paralobes and mesolobes broader in profile than in most species with bifurcate aedeagus (Text-fig. 42), paralobes slightly tapering and with stubby black apical spinules; mesolobes in posterior view as in Text-fig. 59. Length about 9–10 mm.

♀. Vertex 0.29–0.32 of head-width. Third antennal segment 2.4–2.7 times as long as second segment. T₄ dorsally with about six to eight hair series. Pale lemon-yellow colour of parafacials more strikingly contrasting with silvery white parafacials than in ♂.

Material examined. Holotype ♂. CEYLON: Kandy, 6.ii.1923 (*F. P. Jepson*).

Other material. CEYLON: 4 ♂, Galaha, 15.viii.1925 (*F. P. Jepson*) (B.M. Nat. Hist.); 3 ♂, 3 ♀, Galaha, 15.viii.1925 (*J. C. Hutson*) (B.M. Nat. Hist.); 1 ♀, Galaha, 27.xii.1913 (*A. Rutherford*) (B.M. Nat. Hist.); 2 ♀, Kandy, 6.ii.1923 (*J. C. Hutson*) (B.M. Nat. Hist.).

Distribution. Only known from Ceylon.

Hosts. *Eterusia cingala* Moore (Lepidoptera : Zygaenidae). All specimens listed above except for the one collected by Rutherford were reared from larvae of this zygaenid, but it should be noted that they each bear a label with the spelling *Heterusia*—the name of a Neotropical geometrid genus. Mesnil's (1951 : 191) reference to the type being from *Heterusia cingala* should read *Eterusia cingala*.

This species is one of the rather uniform group in which the apices of the paralobes of the male hypopygium bear stubby black spinules, but it is readily distinguished from its relatives by the broader paralobes and (normally) by the complete absence of ocellar setae. *P. laetifica* is one of the several species confused by Baranov, and the specimens (listed above) collected by Hutson each bear an erroneous determination label in Baranov's writing as "*sturmia inconspicuides* Baranoff".

Palexorista inconspicuides (Baranov, 1932)

(Text-figs. 8, 30, 41, 58)

Sturmia inconspicuides Baranov, 1932 : 80. Lectotype ♂, FORMOSA. In Deutsches Entomologisches Institut. [Examined]

Drino (Prosturmia) inconspicuides (Baranov) Mesnil, 1951 : 188.

Palexorista inconspicuides (Baranov) Crosskey, 1966 : 136.

Lectotype Designation: Baranov described *Sturmia inconspicuides* from an unstated number ("zahlreiche") of male and female syntypes collected by Sauter on unspecified dates at Kankau and Sokutsu in Formosa. Twelve syntypes have been located; in the collections of the Deutsches Entomologisches Institut (4 ♂, 4 ♀),

the United States National Museum (2 ♂, 1 ♀) and the British Museum (1 ♂), each bearing an identification and a type label; one male in Deutsches Entomologisches Institut has been labelled and is here designated as LECTOTYPE. Three of the male paralectotypes in the D. Ent. Inst. collection lack the abdomen and three of the females are probably not conspecific with the lectotype.

♂. Head profile as in Text-fig. 8, frontal length about 1.22 times as great as facial length, antennal axis distinctly above ocular axis. Vertex 0.24–0.26 of head-width, upper frons narrow. Upper occiput with an irregular row of black setulae behind postocular row. Interfrontal area subequal in width to parafrontal or a little wider. Outer vertical setae undeveloped. Parafrontals dingy yellowish white to brassy yellow pollinose, not noticeably contrasting in colour with whitish or very pale yellowish pollinose face and parafacials. Parafacials rather narrow, at mid height about subequal in width to third antennal segment or slightly narrower, haired on about uppermost quarter. Antennae of medium length, third segment about 2.5–2.7 times as long as second segment and entirely blackish brown. Palpi brownish with tawny yellowish apices. Mesonotum with yellow pollinosity, giving species a distinctly yellowish appearance, occasionally pale greyish yellow. Tarsal claws long, longer than last tarsal segment. Abdominal ground colour mainly blackish brown but reddish laterally on T₃, pollinosity pale yellowish or yellowish white with shifting appearance on intermediate tergites, dark hind margin of T₄ occupying about one third of length of tergite. Dorsal hair of T₄ in about six to eight series, discal setae of T₅ moderately strong. Hair-patches of T₄ venter large, similar to those of *curvipalpis* (Text-fig. 28). Genitalia: aedeagus of bifurcate type (Text-fig. 30); paralobes with apical spinules, in lateral view wider than mesolobes (Text-fig. 41), paralobe rather parallel-sided and not noticeably angulate near middle (cf. *munda*, Text-fig. 40); mesolobes in posterior view elongate and acuminate (Text-fig. 58). Length 8–11 mm.

♀. Vertex 0.32 of head-width. Third antennal segment about 2.2 times as long as second segment. Interfrontal area distinctly wider than parafrontal. Dorsum of T₄ with about six hair series.

Material examined. Lectotype ♂. FORMOSA: Kankau, Koshun, 7.viii.1912 (*H. Sauter*).

Paralectotypes. FORMOSA: 1 ♂, Sokutsu, ix.1912 (*H. Sauter*) (B.M. Nat. Hist.); 1 ♂, 1 ♀, data as for lectotype (D. Ent. Inst.); 2 ♂, Sokutsu, ix.1912 (*H. Sauter*) (D. Ent. Inst.).

Two female paralectotypes with the same data as the lectotype, and a female paralectotype from Kankau, ix.1912, have been examined from D. Ent. Inst. collection but are considered to be misidentified and not conspecific with the lectotype.

Distribution. The true *Palexorista inconspicuooides* (Baranov) is known only from Formosa and I have seen no material other than the original syntypes. It is possible that *inconspicuooides* occurs elsewhere in the Oriental Region, but there is no evidence as yet that it does so and I have found no specimens that are assignable to the true *inconspicuooides* among the large amount of Oriental material seen.

The literature on agricultural and forest entomology in the Oriental Region contains records of *Sturmia inconspicuooides* Baranov from India (Beeson & Chatterjee, 1935; Cherian, 1937; Cherian & Kylasam, 1939; Cherian & Anantanarayanan, 1941), Burma (Garthwaite & Desai, 1939), Malaya (Corbett & Miller, 1933; Corbett, 1937), Indonesia (Tjien Mo, 1939), Queensland (Bell, 1936, 1937, 1938), and Solomon Islands (Lever, 1935) but these records are based on misidentifications made by

Baranov (who identified Oriental Tachinidae for the Imperial Institute of Entomology between 1932 and 1940): the British Museum collection contains specimens of five species (*subanajama*, *lucagus*, *laetifica*, *ophirica* and *curvipalpis*) misidentified by Baranov as *inconspicuooides*, most being part of the material on which the foregoing erroneous records were based. Baranov's (1934a, 1936) published records of *inconspicuooides* from New Britain, Fiji and the Solomon Islands are due to misidentification.

Hosts. Unknown. All the host records for *Sturmia inconspicuooides* appearing in the literature (these are detailed in the later section on host records) are either erroneous or very suspect because of misidentification of the tachinid parasites involved. As noted above, Baranov confused at least five species under the name *inconspicuooides* and the published host records for this species are based on identifications made by Baranov for the Imperial Institute of Entomology.

P. inconspicuooides is one of the complex of species in which the aedeagus is of the bifurcate type and the paralobes of the male hypopygium bear apical spinules. It is most closely related to *P. munda* (Wiedemann), from southern India, but should probably be regarded as a distinct species because of the differently shaped paralobes, the presence of a row of black setulae on the upper occiput (absent in *munda*), the narrower parafacials, and differences in the pollinosity. Mesnil (1949 : 19) placed the name *inconspicuooides* in synonymy with *Drino (Prosturmia) profana* (Townsend), but this synonymy was wrongly established; examination of the type-material of *profana* shows that it belongs to another species (see *solemnis* Walker). Mesnil (1951 : 188) was himself later doubtful of the synonymy and treated *inconspicuooides* as valid, then indicating *profana* as only doubtfully the same.

Palexorista munda (Wiedemann, 1830)

(Text-figs. 7, 40, 57)

Tachina munda Wiedemann, 1830 : 234. Holotype ♀, INDIA. In Universitetets Zoologiske Museum, Copenhagen. [Examined]

Drino (Prosturmia) munda (Wiedemann) Crosskey, 1963 : 80.

Palexorista munda (Wiedemann) Crosskey, 1966 : 136.

♂. Head profile as in Text-fig. 7, frontal length about 1.12 times as great as facial length, antennal axis conspicuously above ocular axis. Vertex 0.25-0.27 of head-width, upper frons rather narrow. Upper occiput without black setulae behind postocular row. Interfrontal area equal in width to parafrontal. Parafrontals very pale greyish yellow pollinose and not contrasting in colour with creamy whitish pollinose face and parafacials. Parafacials about equal in width to, or slightly wider than, third antennal segment, haired on about uppermost third or two-fifths. Antennae of medium length, third segment 2.4-2.6 times as long as second segment and entirely blackish brown. Palpi dark brown basally and tawny yellowish at tips. Mesonotum pale grey or slightly yellowish grey pollinose, species appearing greyish and not at all yellowish to naked eye. Tarsal claws long. Abdomen mainly dark, only indistinctly reddish brown in ground colour basally, with pale greyish yellow pollinosity, intermediate tergites broadly dark posteriorly, about posterior quarter of T₄ black, pollinosity of intermediate tergites with slightly shifting appearance. Dorsal hair of T₄ in about seven or eight series; discal setae of T₅ moderately strong. Hair-patches of T₄ venter large, similar to those of *curvipalpis* (Text-fig. 28). Genitalia: aedeagus of bifurcate type and exactly similar to that of *incon-*

spicuooides (Text-fig. 30); paralobes and mesolobes in lateral view as in Text-fig. 40, paralobes slightly angled and tapering on distal half, with apical spinules; mesolobes in posterior view as in Text-fig. 57. Length about 8.5–10 mm.

♀. Vertex 0.30–0.32 of head-width. Third antennal segment 2.0–2.4 times as long as second segment. Interfrontal area at narrowest distinctly narrower than parafrontal. Parafacial hair on as much as upper half. Dorsal hair of T₄ in about six or seven series. [Detailed description of ♀ holotype in Crosskey (1963).]

Material examined. Holotype ♀. SOUTH INDIA: Tranquebar (no other data).

Other material. SOUTH INDIA: 2 ♂, 1 ♀, Coimbatore, ex *Hippotion*, 15.i.1917 (B.M. Nat. Hist.); 1 ♂, Coimbatore, xi.1951 (*P. S. Nathan*) (B.M. Nat. Hist.); 1 ♂, Coimbatore, xii.1951 (*P. S. Nathan*) (Can. Nat. Coll.).

Distribution. Southern India.

Hosts. *Hippotion* sp. (Lepidoptera : Sphingidae).

Palexorista munda is very closely allied to *P. inconspicuooides* from Formosa, but appears certainly to be a distinct species: it differs from *inconspicuooides* in the head facies, less yellow colour, broader and more angulate-tapering paralobes of the male hypopygium, and in the absence of a row of black setulae on the upper occiput.

The name *munda* Wiedemann has been misused by several authors, and Mesnil (1952 : 236) cited the name as a senior synonym of *Blepharella lateralis* Macquart, type-species of *Blepharella* Macquart (syn. *Podomyia* Brauer and Bergenstamm). The identity of Wiedemann's type of *Tachina munda* was discussed in a recent paper (Crosskey, 1963), where it was shown that *munda* is a sturmiine with bare facial ridges assignable to *Prosturmia* Townsend (now in synonymy with *Palexorista*) and not to *Blepharella*; *munda* is not an older name for *lateralis* Macquart.

Palexorista lucagus (Walker, 1849)

(Text-figs. 6, 24, 31, 77)

Tachina lucagus Walker, 1849 : 768. Holotype ♂, CHINA. In British Museum (Natural History), London. [Examined]

Lydella lucagus (Walker) Bigot, 1892 : 185.

Blepharipoda lucagus (Walker) Husain & Mathur, 1924 : 121.

Palexorista lucagus (Walker) Crosskey, 1966 : 1366.

♂. Head profile as in Text-fig. 6, frontal length about 1.04 times as great as facial length, antennal axis well above ocular axis. Vertex 0.27–0.28 of head-width. Upper occiput without black setulae behind postocular row, rarely one or two isolated adventitious black setulae. Interfrontal area usually slightly wider than parafrontal. Parafrontals very pale brassy yellowish or greyish yellow, colour merging into and not contrasting with creamy or rather shining whitish pollinose face and parafacials. Parafacials narrow, distinctly narrower than third antennal segment, haired on about uppermost third or quarter. Antennae with second segment unusually long, third segment about 2.4 times as long as second segment and entirely blackish brown except for trace of orange colour at junction with second segment. Palpi brownish basally and more tawny or yellowish apically. Mesonotum with very pale greyish yellow or pale yellow pollinosity, general appearance of species slightly yellowish, especially in specimens from New Guinea; black vittae of mesonotum conspicuous and sometimes edged with bronze-brown pollinosity. Tarsal claws long. Abdomen with blackish brown ground colour and very pale yellowish grey pollinosity, intermediate tergites with slightly shifting appearance and both broadly black posteriorly, marginal dark band of T₄ occupying about two-fifths of length of

tergite. Dorsal hair of T₄ in about four to six series; discal setae of T₅ very strong. Hair-patches of T₄ venter very characteristic, exceptionally large and occupying almost all of tergite venter (Text-fig. 24), area around hair-patch bare and shining metallic black. Genitalia: aedeagus of bifurcate type (Text-fig. 31); paralobes and mesolobes slender, latter in profile rather straight and evenly tapering (Text-fig. 38); paralobes with small apical spinules; mesolobes in posterior view as in Text-fig. 56. Length usually about 6 mm., ranging from 4.8–7.5 mm., smaller than average species.

♀. Vertex 0.31–0.33 of head-width. Second antennal segment strikingly long, more noticeably so than in ♂, facial view of head and antennae as in Text-fig. 77, third antennal segment 1.7–2.2 times as long as second segment. Interfrontal area subequal in width to parafrenal. Dorsal hair of T₄ in only four or five series, hair therefore sparser than usual.

Puparium: spiracular slits slightly sinuous, surface hairs not at all spiniform.

Material examined. Holotype ♂. CHINA: Foo-chow-foo (G. T. Lay).

Other material: WEST PAKISTAN: 4 ♂, Punjab, Lyallpur, par. on *Cretonotus gangis* L. on pulses, 25.x.1916 (D. Nath). INDIA: 2 ♂, 3 ♀, S. Malabar, Vadakampuram, par. on *Spodoptera mauritia*, 15–21.iv.1916 (P.S.); 1 ♀ with puparium, S. Malabar, Tirurangady, par. on *Spodoptera mauritia* on paddy, 18.vi.1919 (Dy. Tahsildar); 1 ♂ with puparium, Bangalore, ex caterpillar of *Lymantria* sp. on mango, xii.1962; 1 ♂, Bangalore, ex hairy caterpillar on ground, ix.1962. CEYLON: 1 ♀, Peradeniya, vi.1909. THAILAND: 1 ♂, Siam, Bangkok, ex *Spodoptera* sp. larva, 1934–35 (A. Manjikul). MALAYA: 1 ♂, Pahang, ex *Spodoptera* sp., 31.iii.1927 (G. H. Corbett). NEW GUINEA: 4 ♂, 1 ♀, Papua, Kapogere, 60 m. S.E. of Port Moresby, 3.v.1965 (R. W. Crosskey); 1 ♀, Papua, Central District, Musgrave River, 6.v.1965 (R. W. Crosskey); 1 ♀, Papua, Central District, Musgrave River, 18.vii.1965 (R. W. Crosskey); 2 ♂, Morobe District, Wau, 3,500–4,000 ft., 19 and 23.v.1965 (R. W. Crosskey); 1 ♀, Morobe District, near Wau, Nami Creek, 5,500 ft., 22.v.1965 (R. W. Crosskey); 4 ♂, 5 ♀, Morobe District, Bubia, 9 m. W. of Lae, 16–21.vi.1965 (R. W. Crosskey).

All above-listed material in British Museum (Natural History).

Distribution. Although as yet known only from a small amount of material, *P. lucagus* (Walker) appears to be a widespread species in the Oriental Region, occurring from West Pakistan and Ceylon eastwards to China and New Guinea. There are few records as yet from south-east Asia and none from Indonesia, although *lucagus* probably occurs here. *P. lucagus* possibly occurs in Queensland, as it is present in Papua, but it is not yet known from Australia.

Hosts. Known from the following lepidopterous hosts: *Cretonotos gangis* (Linnaeus) from West Pakistan [Arctiidae], *Spodoptera mauritia* (Boisduval) [Noctuidae] in India and *Spodoptera* sp. in Thailand and Malaya, and *Lymantria* sp. [Lymantriidae] in India. The specimens listed above from West Pakistan reared from *Cretonotos gangis* are part of the material on which Husain & Mathur (1924) based their record of *lucagus* parasitic on this host.

Pallexorista lucagus is one of the most distinctive Oriental species of the genus on external characters because of the enormous abdominal hair-patches of the male, much larger than in other species, and because of the unusually long second antennal segment which forms a particularly notable character in the female: although differing from other species in these characters, the general affinities of *lucagus* are

with the other species in which the male paralobes bear apical spinules. In the small size and overall facies there is close resemblance to *P. solennis* (except in the large male hair-patch), but this species differs from *lucagus* in lacking spinules on the paralobes of the male hypopygium.

Palexorista subanajama (Townsend, 1927)

(Text-figs. 5, 37, 55)

Prosturmia subanajama Townsend, 1927 : 69. Lectotype ♂, SUMATRA. In Zoölogisch Museum, Amsterdam. [Examined]

Palexorista subanajama (Townsend) Crosskey, 1966 : 136.

Lectotype Designation: the type-material of *P. subanajama* comprises two conspecific male syntypes, one in the Zoölogisch Museum, Amsterdam and one in the United States National Museum, Washington; the specimen in Amsterdam has been labelled and is here designated as LECTOTYPE.

♂. Head profile as in Text-fig. 5, frontal length about 1.04 times as great as facial length, antennal axis far above ocular axis. Vertex 0.24–0.26 of head-width, upper frons usually rather noticeably narrow. Upper occiput without black setulae behind postocular row, occasionally one or two adventitious setulae present. Interfrontal area subequal in width to a parafrontal. Parafrontals with pollinosity varying in colour from pale grey (as in lectotype) to brassy yellow, usually greyish yellow, contrasting noticeably with white or creamy whitish pollinose face and parafacials; parafacials sometimes pale brassy yellow pollinose in specimens with more golden parafrontals. Parafacials narrow, a little narrower than third antennal segment, rather conspicuously and finely long haired on uppermost third or half. Antennae long, third segment 2.9–3.8 times as long as second segment (3.8 times in lectotype) and entirely blackish brown. Palpi brown or blackish brown, sometimes more yellow brown and with more yellowish or tawny brown apices. Mesonotum with pollinosity varying from pale grey (as in lectotype) to golden yellow, usually pale yellowish, sometimes with traces of bronze-brown pollinosity around the black vittae; dorsum of thorax usually distinctly yellowish to naked eye. Tarsal claws long. Abdomen with dark brown to blackish ground colour and pale grey to golden yellow pollinosity, pattern of intermediate tergites with slightly shifting appearance, most of T₃ dark dorsally with the dark area extending medially nearly to fore margin so that the yellow or greyish pollinosity is mainly antero-lateral, pollinosity of T₄ on basal half only so that to naked eye at least posterior half of this tergite appears black. Dorsal hair of T₄ in about six to eight series; discal setae of T₅ long and moderately strong. Hair-patches of T₄ venter of medium to large size, much as in *curvipalpis* (Text-fig. 28). Genitalia: aedeagus of bifurcate type, similar to that of *inconspicuooides* (Text-fig. 30); paralobes and mesolobes elongate, paralobes with stubby black apical spinules and mesolobes in profile straight and rather evenly tapering (Text-fig. 37); mesolobes in posterior view as in Text-fig. 55. Length usually about 8–9.5 mm., ranging from 5.8–10.9 mm. in material seen.

♀. Vertex 0.28–0.29 of head-width. Third antennal segment 2.2–2.6 times as long as second segment. Interfrontal area slightly, but distinctly and rather consistently, wider than a parafrontal. Parafacials usually less extensively haired than in ♂, hairing confined to uppermost quarter or third.

Material examined. Lectotype ♂. SUMATRA: Suban Ajam, vii. 1916 (*E. Jacobson*).

Paralectotype ♂. Data as for lectotype (U.S. Nat. Mus.).

Other material. MALAYA: 2 ♂, Temerloh, ix. 1922 (*G. H. Corbett*). SARAWAK: 1 ♂, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 5. ix. 1932 (*B. M. Hobby &*

A. W. Moore). NEW GUINEA: 1 ♂, 1 ♀, Japen Island, camp 2, Mt. Eiori, 2,000 ft., xi. 1938 (*L. E. Cheesman*); 1 ♂, Waigeu, Camp Nok, 2,500 ft., iv. 1938 (*L. E. Cheesman*); 1 ♀, Papua, Ishurava, 3,000 ft., vii. 1933 (*L. E. Cheesman*); 1 ♂, 2 ♀, Papua, Northern District, Moale Plantation, ix. 1965 (*T. Bourke*); 1 ♀, Papua, Popondetta, Girua Plantation, 4.i. 1966 (*T. V. Bourke*); 1 ♂, Papua, Central District, Gaile Forest, 28 m. S.E. of Port Moresby, 5.v. 1965 (*R. W. Crosskey*); 3 ♂, Papua, Central District, Musgrave River, 11.v. 1965 (*R. W. Crosskey*); 1 ♀, Papua, Central District, Musgrave River, 18.vii. 1965 (*R. W. Crosskey*); 5 ♂, 4 ♀, Papua, Central District, Kapogere, 60 m. S.E. of Port Moresby, 3.v. 1965 (*R. W. Crosskey*); 92 ♂, 6 ♀, Morobe District, Wau, 3,500–4,000 ft., 14–23.v. 1965 (*R. W. Crosskey*); 12 ♂, Morobe District, Nami Creek nr. Wau, 5,500 ft., 22–23.v. 1965 (*R. W. Crosskey*); 4 ♂, Morobe District, Lae area, Busu River Forest, 17.vi. 1965 (*R. W. Crosskey*); 1 ♂, Morobe District, Bubia, 9 m. W. of Lae, 19.vi. 1965 (*R. W. Crosskey*); 3 ♂, 2 ♀, Eastern Highlands, Goroka, 26–30.v. 1965 (*R. W. Crosskey*); 4 ♂, Eastern Highlands, 7 m. S.E. of Goroka, 26–27.v. 1965 (*R. W. Crosskey*); 2 ♂, 2 ♀, Eastern Highlands, Fore, 30 m. S.E. of Goroka, 25.v. 1965 (*R. W. Crosskey*); 23 ♂, 3 ♀, Western Highlands, Mt. Hagen, 3–7.vi. 1965 (*R. W. Crosskey*); 2 ♀, Western Highlands, Olgolboly, 13 m. E. of Mt. Hagen, 4.vi. 1965 (*R. W. Crosskey*). NEW BRITAIN: 30 ♂, Keravat, 25.viii. 1965 (*Dept. Agric.*); 1 ♀, Rabaul, 30.vii. 1937 (*J. L. Froggatt*); 15 ♂, Keravat, 25.vi–4.vii. 1965 (*R. W. Crosskey*). BOUGAINVILLE: 9 ♂, 2 ♀, Numa Numa, 13–14.vii. 1965 (*G. S. Dun*); 1 ♂, Sabah Plantation, 12.vii. 1965 (*G. S. Dun*); 16 ♂, Arawa, 4–7 m. N. of Kieta, 11.vii. 1965 (*R. W. Crosskey*); 12 ♂, Aropa area, 12 m. S. of Kieta, 8–10.vii. 1965 (*R. W. Crosskey*). SOLOMON ISLANDS: 1 ♂, Guadalcanal, Mamara, 25.iv. 1964 (*B. McQuillan*). QUEENSLAND: 1 ♂, 1 ♀, Gordonvale, 23.vi. 1938 (*J. H. Buzacott*); 2 ♂, 3 ♀, ii. 1903 [no locality data within Queensland: one of males aberrant, with only one pair of reclinate orbital setae].

All above-listed material in British Museum (Natural History).

Distribution. From Malaya and Sumatra eastwards to Queensland and the Solomon Islands: no material has been seen from Indonesia but the species must almost certainly occur there. *P. subanajama* appears to be by far the commonest species of *Palexorista* occurring in the Territory of Papua and New Guinea, including the Bismarck Archipelago and Bougainville Island.

Hosts. *Palexorista subanajama* parasitizes *Tiracola plagiata* (Walker) (Lepidoptera: Noctuidae), a pest of castor oil and tapioca, in New Guinea and Malaya. The records of *ophirica* and *inconspicuooides* as parasites of *Tiracola plagiata* published by Greenstreet & Lambourne (1933) and by Corbett & Miller (1928, 1933) are based on misidentifications of the Tachinid and actually refer to *P. subanajama* (the specimens listed above from Malaya were reared by Corbett from *T. plagiata* and are so labelled).

Other known hosts, confirmed from reared material listed above, are *Polydesma umbricola* Boisduval (Noctuidae) and *Acantholeucania loreyi* (Duponchel) in New Britain and Queensland respectively. The latter species, under the name *Cirphis loreyi*, has been recorded in the literature as host of *P. inconspicuooides* (Baranov) in Queensland by Bell (1936, 1938), but the true *inconspicuooides* is not known outside Formosa and these records almost certainly refer to *P. subanajama* (one of the species sometimes misidentified by Baranov).

Palexorista subanajama is one of the group of species showing apical spinules on the paralobes of the male hypopygium, and is one of the closely allied species with this character misidentified by Baranov as *inconspicuoides*: although closely related to this species, *subanajama* differs conspicuously in the shape of the paralobes and mesolobes of the male genitalia, in lacking black upper occipital setulae, and in the much longer antennae. Superficially *P. subanajama* is very similar to *P. solennis* but differs mainly in the large hair-patches of T₄ venter, in the absence of black setulae on the upper occiput, and in the presence of spinules on the paralobes.

***Palexorista solennis* (Walker, 1859)**

(Text-figs. 10, 23, 43, 60)

Masicera solennis Walker, 1859 : 98. Holotype ♂ [not ♀] ARU ISLANDS. In British Museum (Natural History), London. [Examined]

Tachina succini Giebel, 1862 : 319. Holotype ♀, probably ORIENTAL REGION (in copal). In Naturwissenschaftlichen Museum der Coburger Landesstiftung, Coburg. [Examined] [synonymy by Crosskey, 1966 : 134]

Meigenia latestriata Wulp, 1881 : 39. Holotype ♂, SUMATRA. In Rijksmuseum van Natuurlijke Historie, Leiden. [Examined] **syn. n.**

Crossocosmia discreta Wulp, 1893 : 164. Lectotype ♂, JAVA. In Zoölogisch Museum, Amsterdam. [Examined] **syn. n.**

Blepharipoda solennis (Walker) Austen, 1907 : 341.

Palexorista succini (Giebel) Townsend, 1921 : 134.

Prosturmia profana Townsend, 1927 : 69. Syntypes ♂, SUMATRA. In United States National Museum, Washington. [Examined] [Synonymy by Crosskey, 1966 : 134]

Sturmia inconspicuella Baranov, 1932 : 79. Lectotype ♂, FORMOSA. In Deutsches Entomologisches Institut. [Examined] **syn. n.**

Sturmia imperfecta Malloch, 1935 : 353. Holotype ♂, TONGA. In British Museum (Natural History), London. [Examined] **syn. n.**

Drino (Prosturmia) inconspicuella (Baranov) Mesnil, 1949 : 19.

Drino (Prosturmia) discreta (Wulp) Mesnil, 1951 : 181.

Palexorista discreta (Wulp) Crosskey, 1966 : 136.

Palexorista imperfecta (Malloch) Crosskey, 1966 : 136.

Palexorista inconspicuella (Baranov) Crosskey, 1966 : 136.

Palexorista latestriata (Wulp) Crosskey, 1966 : 136.

Palexorista profana (Townsend) Crosskey, 1966 : 136.

Palexorista solennis (Walker) Crosskey, 1966 : 136.

Lectotype Designations: (1) *Crossocosmia discreta* Wulp. Described from two syntypes, a male and a female, both in Amsterdam Museum, of which the male has been labelled and is here designated as LECTOTYPE. The lectotype and the female paralectotype are each labelled "Crossocosmia discreta n.s." with the sex sign on the label and each bears a faded blue label with the words "Java Piepers" almost obliterated. (2) *Sturmia inconspicuella* Baranov. Described from an unstated number ("Sehr zahlreiche") of male and female specimens collected by Sauter at Kankau and Sokutsu in Formosa. The type-material consists of three male syntypes and one female syntype in U.S. National Museum (from the Baranov collection) and of twenty-six male and five female syntypes in the Deutsches Entomologisches Institut: a male specimen examined from the latter collection has been labelled and is here designated as LECTOTYPE. (3) *Prosturmia profana* Townsend. Townsend

based the description of *profana* on four male syntypes from Fort de Kock, and later (Townsend, 1941: 125) stated that the "Ht" (holotype) was in Amsterdam and a "Pt" (paratype) in Washington: the statement of holotype for *profana* is not acceptable as fixation of a lectotype, since it does not restrict to a single recognizable specimen. No type-specimen of *profana* can be found in the collection of the Zoologisch Museum, Amsterdam, and a lectotype is not designated for *profana* at this time: it should be noted however that the collection of the U.S. National Museum contains two of the original four male syntypes, but Dr. Curtis Sabrosky (personal communication) informs me that both correctly belong in Washington—neither being a specimen inadvertently not returned to Amsterdam by Townsend.

♂. Head profile as in Text-fig. 10, frontal length about 1.05 times as great as facial length, antennal axis conspicuously above ocular axis. Vertex 0.25–0.27 of head-width. Upper occiput with an irregular row of black setulae behind postocular row, setulae sometimes very sparse. Interfrontal area at least as wide as parafrontal, usually distinctly wider. Outer vertical setae undeveloped. Parafrontals from greyish or yellowish white to golden pollinose, usually pale brassy yellow pollinose; face and parafacials usually yellowish white pollinose and not noticeably contrasting with parafrontals, sometimes pale brassy yellowish or silvery whitish pollinose, if silver then more contrasting in colour with yellowish parafrontals. Parafacials narrow, slightly narrower than third antennal segment or at most subequal in width; parafacial hair conspicuous, on at least uppermost quarter and usually on uppermost third or parafacial, parafacials occasionally haired on as much as upper half or even two-thirds (as in *solemnis* holotype). Antennae long, third segment 3.2–3.8 times as long as second segment (3.6 in *solemnis* holotype and *inconspicuell*a lectotype; 3.5 in *latestriata* holotype; 3.4 in *discreta* lectotype and *imperfecta* holotype), third segment entirely blackish brown. Palpi brown or blackish basally and yellowish or tawny brownish apically. Mesonotum with greyish to yellow pollinosity, and usually with bronze or coppery brown pollinosity around and between the black vittae, sometimes scutum extensively coppery brown pollinose; the outlining of the black vittae with coppery pollinosity forming noteworthy feature of the species. Tarsal claws long, much longer than last tarsal segment. Abdominal ground colour blackish brown, at most inconspicuously reddish laterally on T₃, pollinosity greyish white or yellowish white to pale yellow (sometimes noticeably coppery around dark areas), pollinosity of intermediate tergites with shifting appearance, pale pollinose area very narrow medially on T₃ which is largely blackish brown on median two-thirds, pollinosity of T₄ on about basal half only so that posterior dark margin is unusually wide (occupying hind half of tergite). Dorsal hair of T₄ in about five to nine series, fewer series in small specimens than in large ones; discal setae of T₅ strong. Hair-patches of T₄ venter unusually small, in some specimens patch reduced to a few hairs only, patch subtriangular and only half as long as tergite (Text-fig. 23), area of tergite basad of the hair-patch with normal surface hairing. Genitalia: aedeagus of bifurcate type, similar to that of *laxa* (Text-fig. 29); paralobes without stubby black apical spinules, few short hairs only, paralobes and mesolobes in lateral view as in Text-fig. 43; mesolobes in posterior view elongate and pointed (Text-fig. 60). Size variable, length usually about 7.5–9.5 mm., ranging from 5.1–11.5 mm. (7.1 mm. in *solemnis* lectotype, 7.5 mm. in *latestriata* holotype, 8.1 mm. in *discreta* lectotype, 10.2 in *inconspicuell*a lectotype, 11.5 mm. in *imperfecta* holotype).

♀. Vertex 0.28–0.31 of head-width. Third antennal segment 2.6–3.1 times as long as second segment, sometimes with reddish suffusion basally and along inner margin. Interfrontal area subequal in width to parafrontal. Parafrontals usually clear pale yellow pollinose and contrasting with white pollinose face and parafacials, parafrontals sometimes golden. Dorsal hair of T₄ in about six or seven series. T₄ blackish brown on about posterior two-fifths.

Puparium. Slits of posterior spiracles slightly sinuous, surface hairing of puparium short, fine and dense.

Material examined. Holotype of *solemnis* ♂. ARU ISLANDS: no locality (*A. R. Wallace*). Holotype of *succini* ♀, in copal of presumed Oriental origin. Holotype of *latestriata* ♂. SUMATRA: Simau[oen], vi.1877. Lectotype of *discreta* ♂. JAVA: no locality (*Piepers*). Syntypes of *profana*, 2 ♂. SUMATRA: Fort de Kock, 920 m., 1924 (*E. Jacobson*). Lectotype of *inconspicuella* ♂. FORMOSA: Kankau, Koshun, viii.1912 (*H. Sauter*). Holotype of *imperfecta* ♂. TONGA: Haapai, 13.ii.1925 (*Buxton & Hopkins*).

Paralectotype of *discreta* ♀. Data as for lectotype (Zool. Mus. Amsterdam). Paratype of *imperfecta* ♂. NEW BRITAIN: Rabaul (*F. H. Taylor*) (S.P.H.T.M. Sydney). Paralectotypes of *inconspicuella*, 22 ♂, 5 ♀. FORMOSA: Kankau, Koshun, iv-xi.1912 (*H. Sauter*) (D. Ent. Inst.) and 1 ♂, FORMOSA: Sokutsu, ix.1912 (*H. Sauter*) (D. Ent. Inst.).

Other material. CEYLON: 2 ♂, Peradeniya, par. of *Crocidolomia binotalis*, 18.viii.1928 (*J. C. Hutson*); 1 ♂, Trincomali, 24.ix.1890 (*Yerbury*). INDIA: 1 ♂, Bangalore, ix.1962; 1 ♂, Coimbatore, ix-x.1947 (*P. S. Nathan*); 1 ♀, Madras, Nilambur, Aravallicava, par. on *Hybloea puera*, 30.ix.1925 (*S. N. Chatterjee*); 1 ♀, Madras, Nilambur, Amarampalam R, 25.iv.1933 (*C. F. C. Beeson*); 1 ♀, Madras, Nilambur, Elenjeri, par. on *Hybloea puera*, 2-3.vii.1925 (*S. N. Chatterjee*); 1 ♀, Madras, Nilambur, par. on *Hybloea puera*, 28.v.1927 (*S. N. Chatterjee*); 1 ♀, Madras, Nilambur, Edacode, par. on *Hybloea puera*, 9.x.1925 (*S. N. Chatterjee*); 1 ♂, Poona, Akola, ex *Cosmophila* sp. on cotton, 20.viii.1963; 1 ♀, Dehra Dun, par. on *Hybloea puera*, 15.xi.1931 (*S. N. Chatterjee*); 1 ♂, 1 ♀, Central Provinces, Houghangabad, Rahatgaon, par. on *Hybloea puera*, 2.ix. & 1.x.1926 (*S. N. Chatterjee*). BURMA: 6 ♂, 10 ♀, Zibingi, nr. Maymyo, par. on *Hybloea puera*, 13.viii.-14.ix.1930 (*D. J. Atkinson*); 1 ♂, 1 ♀, Zigon, Thitcho Reserve, 2 & 3.vii.1930 (*D. C. F.*); 1 ♂, Pinyinmana, Yanaungmyin Reserve, 26.viii.1928 (*D. J. Atkinson*); 1 ♀, Pinyinmana, Yanaungmyin Reserve, par. on *Hybloea puera*, 26.vii.1931 (*D. J. Atkinson*). THAILAND: 2 ♂, Bangkok, 1.i.1930 (*W. R. S. Ladell*). MALAYA: 1 ♂, Kuala Lumpur, par. on *Amathusia phidippus*, 20.xi.1922 (*G. H. Corbett & B. A. R. Gater*). SUMATRA: 1 ♂, Pematang Siantar, Naga Hoeta Estate, 1,750 ft., 20.iv.1931 (*R. I. Nel*). JAVA: 5 ♂, Tjiomas, Buitenzorg, 1.ix.1936 (*J. v. d. Vecht*) (four in Rijksmus. Leiden); 1 ♀, Mt. Gede, ex *Crocidolomia binotalis*, iii.1929 (*S. Leefmans & R. Awibowo*). SABAH: 1 ♂, Kunak, Mostyn Estate, ex oil palm bagworm, 13.vi.1966 (*E. B. Tay*). NEW GUINEA: 2 ♂, Indonesian New Guinea (West Irian), Hollandia, Kota Nica, ex *Homona*, 12.xii.1958 and 2.ii.1959 (*R. T. Simon-Thomas*) (Rijksmus. Leiden); 1 ♂, West Irian, Hollandia, Kota Nica, ex *Homona*, 13.xii.1958 (*R. T. Simon-Thomas*); 9 ♂, 2 ♀, West Irian, Kota Nica, ex *Pyr[au]sta nub[ilalis]*, 19.xii.1958-25.i.1959 (*R. T. Simon-Thomas*) (Rijksmus. Leiden except for 3 ♂ in B.M. Nat. Hist.); 2 ♀, West Irian, Kota Nica, 10.xii.1958 (*R. T. Simon-Thomas*) (Rijksmus. Leiden); 8 ♂, 2 ♀, Papua, Central District, Kapogere, 60 m. S.E. of Port Moresby, 3.v.1965 (*R. W. Crosskey*); 1 ♂, Papua, Central District, Musgrave River, 18.vii.1965 (*R. W. Crosskey*); 1 ♂, 2 ♀, Morobe District, Wau, 3,500-4,000 ft., 18-21.v.1965 (*R. W. Crosskey*); 2 ♂, 2 ♀, Morobe District, nr. Wau, Nami Creek, 5,500 ft., 22-23.v.1965 (*R. W. Crosskey*); 2 ♂, 2 ♀, Eastern Highlands, 7 m. S.E. of Goroka, 27.v.1965 (*R. W. Crosskey*); 2 ♀, Eastern Highlands, Goroka, 28-30.v.1965 (*R. W. Crosskey*);

1 ♂, 2 ♀, Western Highlands, Mt. Hagen, 3-7.vi.1965 (*R. W. Crosskey*); 3 ♂, Madang District, nr. Madang, 11-14.vi.1965 (*R. W. Crosskey*). NEW BRITAIN: 1 ♀, Keravat, 28.vi.1965 (*R. W. Crosskey*). BOUGAINVILLE: 1 ♀, Numa Numa, 13-14.vii.1965 (*G. S. Dun*). QUEENSLAND: 1 ♂, Queensland (no other data). NEW HEBRIDES: 1 ♂, Banks Islands, Vanua Lava, x.1929 (*L. E. Cheesman*); 2 ♂, Banks Islands, Santa Maria I., Gaua, Nombur, 8.x.1922 (*T. T. Barnard*); 1 ♂, Sandwich Id., 15.ix.1922 (*T. T. Barnard*); 1 ♂, Epi Island, 12.vi.1925 (*P. A. Buxton*); 2 ♂, Malekula, Ounua, ii-v.1929 (*L. E. Cheesman*); 1 ♂, Malekula, Malua Bay, vi.1929 (*L. E. Cheesman*). LOYALTY ISLANDS: 1 ♂, E. Lifu Island, Cap des Pins, 18.xi.1949-18.i.1950 (*L. E. Cheesman*). MARIANA ISLANDS: 2 ♂, 1 ♀, Saipan, Char. Kn., 20.viii.1944 (*D. G. Hall*) (U.S. Nat. Mus. except one male in B.M. Nat. Hist.); 3 ♂, Saipan, crops, 15.x.1945 (*D. G. Hall*) (U.S. Nat. Mus.); 1 ♀, Saipan, 28.viii.1951 (*R. M. Bohart*) (Bishop Mus.); 1 ♀, Saipan, As Mahetog area, at light, 5.v.1945 (*H. S. Dybas*) (Bishop Mus.); 1 ♂, Saipan, 1-2 m. E. of Tanapag, 16.iv.1945 (*H. S. Dybas*) (Bishop Mus.); 1 ♂, Rota I., 29.vii.1925 (*Hornbastel*) (Bishop Mus.); 1 ♀, Rota, 18.vi.1951 (*R. M. Bohart*) (Bishop Mus.); 3 ♂, 4 ♀, Agrihan I., 26.vii.1951 (*R. M. Bohart*) (Bishop Mus.); 1 ♂ with puparium, Tenian I. (=Tinian), 1.iii.1946 (*F. C. Hadden*) (Bishop Mus.); 5 ♂, Tenian I. (=Tinian), at light, 6.iii.1946 (*F. C. Hadden*) (Bishop Mus. except one male B.M. Nat. Hist.); 3 ♀, Guam, Talofafo, 28.iv.1946 (*N. L. H. Krauss*) (Bishop. Mus.); 1 ♀, Guam, Pt. Oca, 1.vi.1945 (U.S. Nat. Mus.); 1 ♀ with puparium, Guam, Agana, ex sulphur butterfly pupa, 11.ix.1936 (*O. H. Swezey*) (Bishop Mus.); 1 ♀, Guam, Agana, 7.v.1945 (*G. E. Bohart & J. L. Gressitt*) (U.S. Nat. Mus.); 1 ♂ with puparium, Guam, Piti, ex pago leafroller, 30.xi.1936 (*O. H. Swezey*) (Bishop Mus.); 1 ♀, Guam, Tijan, 2.iv.1936 (*E. H. Bryan*) (Bishop Mus.); 1 ♂, Guam, Yigo, 8.xi.1936 (*O. H. Swezey*) (Bishop Mus.); 1 ♀ with puparium, Guam, Machanao, ex *Enchocnemidia vertumnalis*, 4.vi.1936 (*O. H. Swezey*).

The above-listed material is in British Museum (Natural History) except where otherwise stated.

Distribution. *P. solennis* is the most widely distributed species of *Palexorista* in the Oriental Region and in western Australasia. In Australia itself it is known from Queensland but not from areas further south, and in the Pacific islands occurs at least as far east as Tonga (type-locality of the synonym *imperfecta*). The species may occur in Fiji, but material seen from here (in British Museum collection), although very like *solennis*, differs in having the hair-patches of the male abdomen slightly larger and the tergite without normal hairing basad of the patches and in lacking black setulae behind the postocular row: the Fiji material may therefore belong to a distinct species, and at present the Fiji Islands represent a break in the confirmed distribution of *solennis* (to the west of Fiji *solennis* occurs in the New Hebrides and Loyalty Islands). No material of *solennis* has been seen from China during the present revision, but Mesnil (1949 : 24) has described a variety (*sinensis*) of *Drino* (*Prosturmia*) *inconspicuella* (= *Palexorista solennis*) from Shanghai which is probably conspecific with *solennis* and the range of *P. solennis* in the Oriental Region almost certainly includes southern China, and includes Formosa (the type-locality of *inconspicuella*). *P. solennis* is almost certainly common throughout Indonesia,

although material has been seen only from Aru Islands and the major western islands (Sumatra, Java, Borneo); Franssen (1935) has recorded the species (under the name *inconspicuenta*) from Celebes, this record almost certainly being based on a correct identification.

Hosts. Reared material of *P. solennis*, the commonest Oriental species of *Palexorista*, has been seen from the following lepidopterous hosts: *Crocidolomia binotalis* Zeller (Pyralidae : Pyraustinae) from Ceylon and Java; *Enchocnemidia vertumnalis* (Guenée) (Pyralidae : Pyraustinae) from Guam; *Ostrinia nubilalis* (Hübner) (Pyralidae : Pyraustinae) from Indonesian New Guinea; *Homona* sp. (Tortricidae) from Indonesian New Guinea; *Cosmophila* sp. (Noctuidae) from India; *Hyblaea puera* (Cramer) (Noctuidae) from India and Burma; and *Amathusia phidippus* (Linnaeus) (Amathusiidae) from Malaya. Wulp (1893) recorded that the type-material of *discreta* (= *solenis*) was reared from *Godara comalis* (Guenée); this name is synonymous with *Crocidolomia binotalis* Zeller.

The specimen of *P. solennis* listed above as reared from *Amathusia phidippus* (L.) in Malaya was misidentified when first collected as the European species *P. inconspicua* (Meigen), and is the basis of the erroneous records of Corbett & Miller (1928, 1933) of *inconspicua* as a parasite of this host.

The host records for *Sturmia inconspicuenta* (= *Palexorista solennis*) in the economic literature for which material has not been seen fall into two groups, those that are almost certainly valid and based on correct determination of the tachinid parasite and those that are suspect through probable misidentification: the host records of *Agrotis* (as *Rhyacia*) *ippsilon* (Hufnagel) in Celebes by Franssen (1935), of *Acantholeucania* (as *Cirphis*) *loreyi* (Duponchel) in Queensland by Bell (1939), of *Pyrausta* (as *Hapalia*) *machoceralis* (Walker) in India by Beeson & Chatterjee (1935), of *Margaronia laticostalis* (Guenée) in India by Beeson & Chatterjee (1935) and of *Spodoptera mauritia* (Boisduval) in India by Beeson & Chatterjee (1935) are probably all correct; those of *Telicota palmarum* Moore (= *Cephrenes augiades* (Felder)) in Malaya by Corbett & Miller (1933) and of *Spodoptera* (as *Prodenia*) *litura* (Fab.) in Fiji by Lever (1943) are suspect.

P. solennis is one of the most distinctive species in the Oriental Region, at once distinguishable in the male from other species of *Palexorista* by the exceptionally small hair-patches of T₄ and the presence of normal tergite hairing basad of the patches; apart from *P. laxa*, this species is the only one with bifurcate aedeagus in the Oriental Region in which the paralobes lack apical spinules. The absence of spinules from the paralobes assists in distinguishing *solenis* from *P. subanajama* (Townsend) and *P. aequalis* (Malloch), both of which have a close superficial resemblance except for the larger hair-patches; *P. aequalis* (Malloch) from Samoa is not discussed in the present paper as it does not occur in the Oriental Region, but Text-fig. 39 shows the hypopygium of *aequalis* for comparison with that of *solenis* (the shape of the paralobes and mesolobes is very similar but the former show the conspicuous spinules in *aequalis*). Mesnil (1949, 1951) suggested the possibility that *P. subanajama* was a synonym of *inconspicuenta* = *discreta* (both here synonymized with *solenis*), but examination of the lectotype of *subanajama* shows that the species are quite distinct.

Mesnil (1949) described *Drino* (*Prosturmia*) *inconspicuella* var. *sinensis* from China, later (Mesnil, 1951) citing it as a variety of *discreta* (senior synonym of *inconspicuella*): no material has been seen of var. *sinensis*, but the exceptionally small male abdominal hair-patches mentioned in the description suggest that it is not specifically distinct from *solemnis*.

It should be noted that in my earlier paper (Crosskey, 1966) on *Palexorista* I inadvertently cited the type-locality of *imperfecta* (described by Malloch in *Insects of Samoa*) as Samoa; Tonga is the correct locality.

Palexorista laxa (Curran, 1927)

(Text-figs. 11, 29, 61)

Sturmia laxa Curran, 1927 : 335. Holotype ♂, TANZANIA. In British Museum (Natural History), London. [Examined]

Palexorista laxa (Curran) Crosskey, 1966 : 136.

♂. Head profile as in Text-fig. 11, frontal length about 1.11 times as great as facial length, antennal axis conspicuously above ocular axis. Vertex 0.32–0.34 of head-width (0.32 in holotype), frons unusually and conspicuously broad. Upper occiput without black setulae behind postocular row. Interfrontal area subequal in width to a parafrontal. Outer vertical setae undeveloped. Parafrontals greyish white or yellowish white to pale greyish yellow pollinose, colour not noticeably contrasting with white pollinose face and parafacials. Parafacials unusually broad, distinctly wider than third antennal segment, haired on uppermost third or two-fifths or sometimes on as much as upper half. Antennae long, third segment 2.6–3.0 times as long as second segment and entirely blackish brown or at most with a trace of orange at junction with second segment. Palpi blackish brown basally and tawny yellowish apically. Mesonotum with pale yellowish grey to pale yellow pollinosity. Tarsal claws long. Abdominal ground colour blackish brown, faintly reddish on sides of T₃, pollinosity very pale yellowish and with strong shifting appearance on intermediate tergites, dark hind border of T₄ occupying about one-third of tergite length. Dorsal hair of T₄ in about six or seven series, discal setae of T₅ strong. Hair-patches of T₄ venter large, similar to those of *curvipalpis* (Text-fig. 28) or slightly larger. Genitalia: aedeagus of bifurcate type, shaped as in Text-fig. 29; paralobes haired only, no stubby black apical spinules, paralobes and mesolobes in lateral view shaped as in Text-fig. 44; mesolobes in posterior view elongate and pointed (Text-fig. 61). Length usually about 8–9 mm., ranging from 6.9 to 10.2 mm. in material seen.

♀. Vertex 0.35–0.37 of head-width. Third antennal segment 2.2–2.5 times as long as second segment, latter sometimes reddish. Interfrontal area subequal in width to or slightly narrower than parafrontal, seen from in front with thin whitish pollinosity so that whole frons appears rather greyish white in some lights; parafrontals at most only faintly yellowish. Lower pair of reclinate orbital setae much smaller than upper pair, size differential more conspicuous than in most species. Dorsal hair of T₄ in about six or seven series, black margin of T₄ occupying only about posterior quarter of tergite.

Puparium: slits of posterior spiracles almost straight or with slight simple curvature, surface hairs not spiniform.

Material examined. Holotype ♂ with puparium. TANZANIA: Tanganyika, Morogoro, ex *Chloridea obsoleta*, vii. 1923 (*A. H. Ritchie*).

Paratypes. TANZANIA: 2 ♀, one with puparium, data as for holotype (B.M. Nat. Hist.); 1 ♀, Kimamba, parasite of maize leaf caterpillars (*A. H. Ritchie*) (B.M. Nat. Hist.).

Other material. TANZANIA: 1 ♂, 1 ♀, Ilonga, Kilosa, ex *H. armigera* on maize, 27.iv.1950 (*H. J. Disney*); 1 ♂, 1 ♀, Ilonga, ex *H. armigera* on cotton, 3 and 5.vi.1949

(*H. J. Disney*); 1 ♀, Msowero, ex *H. armigera* on cotton, 12.vii.1949 (*H. J. Disney*); 10 ♂, 9 ♀, Ilonga, ex *H. armigera*, 25.iv.-23.vii.1962 (*I. A. D. Robertson*); 5 ♂, 1 ♀, with puparia, Ukiriguru, ex *H. armigera* on cotton, 22.v.-3.vii.1961 (*I. A. D. Robertson*); 2 ♂, Ukiriguru, ex *Heliothis armigera* larva, v.1962 (*W. Reed*). UGANDA: 1 ♀, Masindi, em. from cocoon, 10.viii.1923 (*H. Wilkinson*). MALAWI: 1 ♀, Nyasaland, Ntonowe, ex caterpillars, 30.i.1923 (*C. Smees*). RHODESIA: 1 ♂, 2 ♀, with puparia, Mazoe, ex *Heliothis armigera*, 5 and 12.xi.1938 (*E. Parry-Jones*). SOUTH AFRICA: 2 ♀, Zeekeovlei, ex *Heliothis armigera*, 10.xi.1951 (*H. W. Bedford*); 1 ♀, Natal, Richmond, 30.v.1937 (*W. F. Jepson*). SUDAN: 1 ♂, Tokar, 21.x.1912 (*H. H. King*). INDIA: 1 ♂, 1 ♀, Madhya Pradesh, Pipariya.

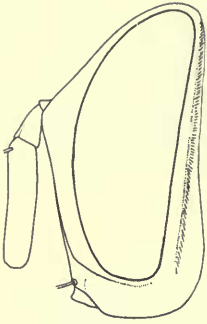
All above-listed material in British Museum (Natural History).

Distribution. *Palexorista laxa* is widespread and probably common throughout eastern Africa from South Africa to the Sudan; until recently it was not known from the Oriental Region, but it can now be established that it occurs in India. Reared material, ex *Heliothis* from India, currently in culture in Georgia, U.S.A., is indistinguishable in male genitalia and all other characters from the holotype and other material of *P. laxa* (Curran) reared from *Heliothis* in Africa. As yet no records exist of *laxa* from anywhere between eastern Africa and India, but the species almost certainly occurs in the intervening area (the British Museum collection contains specimens of the very closely related species *Palexorista zonata* (Curran) from Arabia and of an undescribed species of *Palexorista* from Aden). *P. laxa* is the only species of the genus, other than *P. parachrysois*, that is known to occur in both Ethiopian and Oriental Regions. It is not yet known from Egypt (although it may well occur there), but the closely allied species *P. imberbis* (Wiedemann) occurs there and elsewhere in the Middle East.

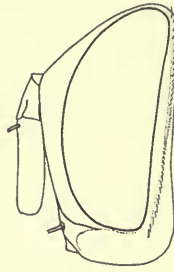
Hosts. The only authenticated host of *P. laxa* is the Old World Cotton Bollworm, *Heliothis armigera* (Hübner) (Lepidoptera : Noctuidae), a widespread pest of cotton and of maize and other cereal crops in Africa, southern and eastern Asia, Queensland and the western Pacific; material of *P. laxa* reared from this host has been seen from Tanzania, Rhodesia, South Africa and India during the preparation of this paper. The holotype of *laxa* was reared from *H. armigera*, but is labelled ex *Chloridea obsoleta*; for many years *armigera* was referred to in the Old World economic literature as *obsoleta* Fab., but this name applies to the New World Cotton Bollworm, *Heliothis zea* (Boddie).

Curran (1927) recorded that one of the female paratypes of *Sturmia laxa* was bred from *Laphygma* (= *Spodoptera*) *exempta* Walker (Noctuidae). This paratype has not been seen and I do not know its whereabouts, but it appears likely that it was not correctly associated with the male holotype and this host record must be regarded as suspect. Similarly, no material has been seen on which the record of *laxa* as a parasite on *Cirphis* (= *Acantholeucania*) *loreyi* Duponchel could be based (Jack, 1935 : 564) and the record cannot be substantiated at present. Thus *Heliothis armigera* is the only proven host of *Palexorista laxa*, and, it may be noted, *laxa* is the only species of *Palexorista* certainly known to parasitize the Old World Cotton Bollworm.

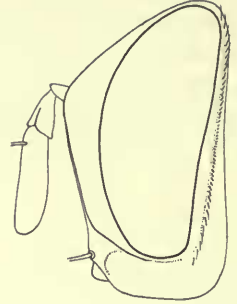
Mesnil (1949, 1951) treated *laxa* as a synonym of *Drino* (*Prosturmia*) *imberbis*



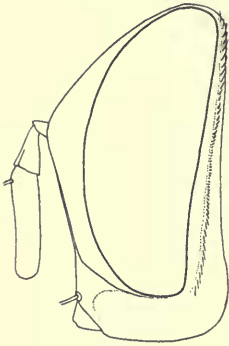
5



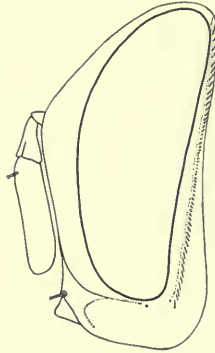
6



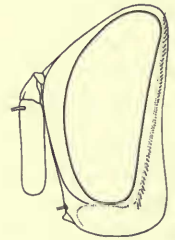
7



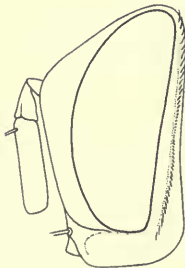
8



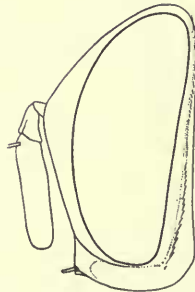
9



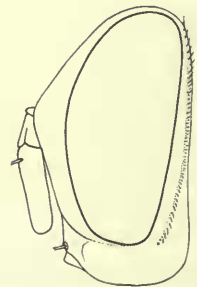
10



11



12



13

FIGS. 5-13. Outline head profile of male of: 5, *P. subanajama*, lectotype; 6, *P. lucagus*; 7, *P. munda*; 8, *P. inconspicuides*, lectotype; 9, *P. laetifica*, holotype; 10, *P. solennis*, holotype; 11, *P. laxa*, holotype; 12, *P. reclinata*, paratype; 13, *P. bisetosa*, holotype.

(Wiedemann), a species described from Egypt. It has not been possible to see any type-material of *imberbis* (see fuller discussion of this species in a later section), but presuming this species as currently understood to be correctly identified there appears to be no doubt that *laxa* and *imberbis* are distinct species, and the synonymy established by Mesnil is here not accepted. Both species are undoubtedly very closely allied, and both have an exceptionally wide frons, but the male genitalia differ considerably in the shape of the paralobes and mesolobes; the differences are discussed in more detail later in this paper. The lack of spinules on the paralobes is unusual in species of *Palexorista* in which the aedeagus is of the bifurcate type, and the only other species occurring in the Oriental Region with bifurcate aedeagus but lacking such spinules is *P. solennis*: *laxa* is easily distinguished from *solennis* by the large hair-patches of the male abdomen and by the absence of black occipital setulae. The very wide frons and paralobes without spinules will distinguish *laxa* from *P. munda*, a generally similar species in southern India.

Palexorista dilaticornis (Mesnil, 1951)

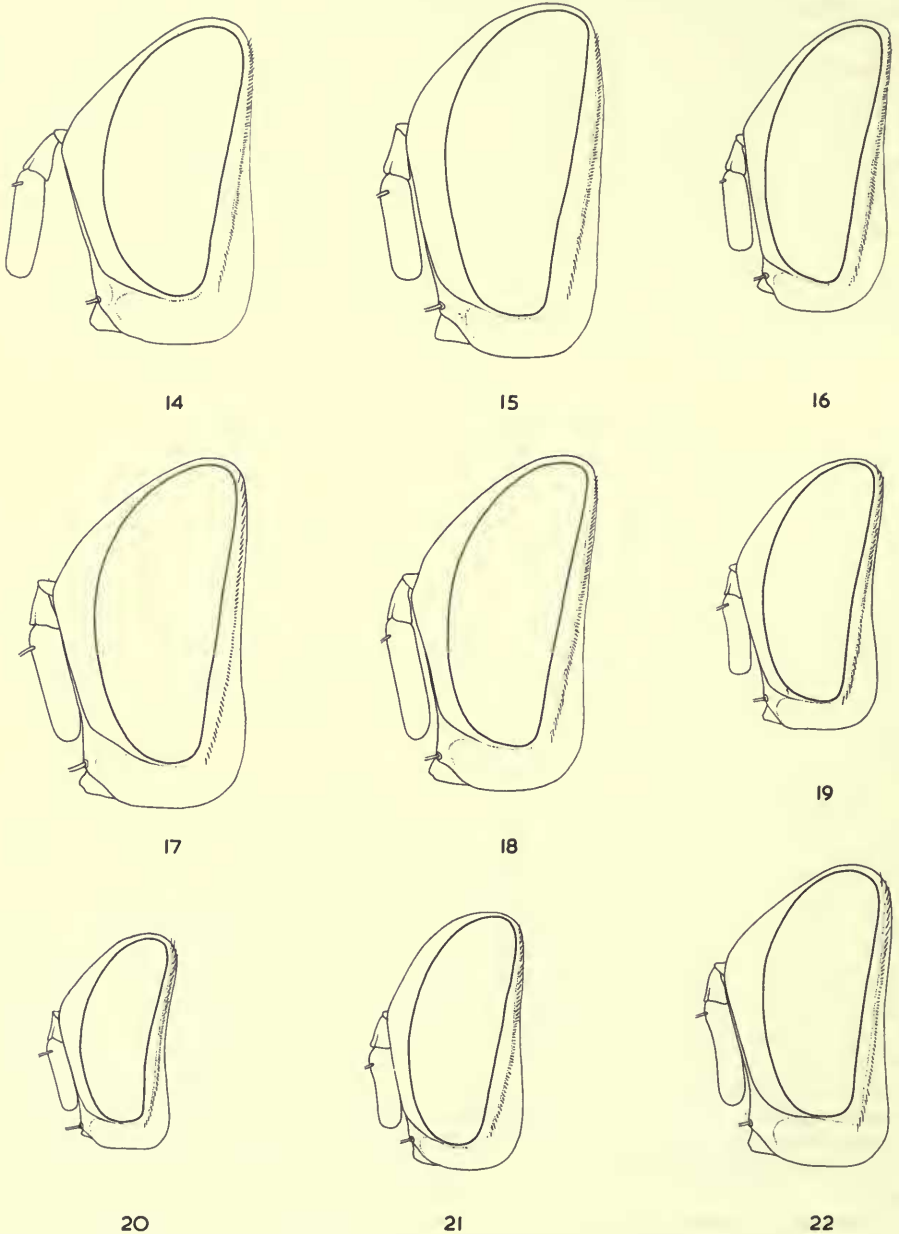
Drino (*Prosturmia*) *dilaticornis* Mesnil, 1951 : 179. Holotype ♂, INDIA (probably lost, see below).
Palexorista dilaticornis (Mesnil) Crosskey, 1966 : 135.

Note. Dr. Mesnil informs me that the male holotype of *dilaticornis* was returned to the British Museum (Natural History) after description, but it cannot now be found in the British Museum collection and is not by chance still in Dr. Mesnil's collection; it must be considered probably lost. No other material of the male sex is known and the description of the male given below is based on characters mentioned in the original description. Both sexes were described by Mesnil, and a female paratype is in the British Museum; data of this specimen were not cited in the original description but are given below.

♂. Antennal axis far above ocular axis. Vertex about 0.25 of head-width (deduced from statement "Stirn so breit wie 2/3 eines Auges von oben gesehen" in original description). Upper occiput with an irregular row of black setulae behind postocular row. Interfrontal area slightly narrower than a parafrontal. Outer vertical setae hair-like. Parafrontals pale yellowish pollinose, face and parafacials thickly whitish pollinose. Parafacials at mid height subequal in width to third antennal segment, haired on about upper half. Antennae long and unusually heavy, third segment about 2.5-3.0 times as long as second segment and entirely blackish brown. Palpi blackish brown basally and yellowish apically. Mesonotum with ashy grey to yellowish grey pollinosity, species with mainly greyish appearance. Tarsal claws long. Abdomen with mainly dark ground colour but yellowish laterally on T₃ and T₄, pollinosity mainly ashy grey, dorsum with very distinct dark median line widest on T₃, T₄ pollinose on basal half and blackish hind margin occupying about posterior half of tergite. Discal setae of T₅ strong. Hair-patches of T₄ venter rather small and rounded, only about half the width of one half-tergite. [Genitalia not described or figured by Mesnil, aedeagus probably of bifurcate type]. Length presumed about 6 mm. [original description states 6-8 mm. for type-material and available ♀ paratype measures 8.1 mm.]

♀. Vertex 0.33 of head-width. Third antennal segment 3.6 times as long as second segment. Head pollinosity all greyish white. Interfrontal little narrower than parafrontal. Dorsal hair of T₄ in about six or seven series.

Material examined. Paratype ♀. INDIA: S. Coorg, Tithimatti, par. on Geometridae, 14.x.1940 (*B. M. Bhatia*) (B.M. Nat. Hist.).



FIGS. 14-22. Outline head profile of male of: 14, *P. ophirica*, paralectotype; 15, *P. curvipalpis*, lectotype; 16, *P. deducens*, lectotype; 17, *P. immersa*, from paralectotype of *latiforceps*; 18, *P. summaria*, paralectotype; 19, *P. painei*, lectotype; 20, *P. parachrysops*; 21, *P. sororcula*, holotype; 22, *P. bancrofti*, holotype.

Distribution. Known only from southern India.

Hosts. The type-material was reared from the larva of an unidentified species of Geometridae (Lepidoptera).

The loss of the holotype and the absence of other male specimens make it impossible to determine the affinities of *P. dilaticornis*; there is a superficial resemblance of the female to *P. immersa* (Walker) and Mesnil (1951 : 159) runs *dilaticornis* out in the same key-couplet as *latiforceps* Baranov (of which *immersa* is senior synonym). It is not impossible that *dilaticornis* is the same as *P. summaria* (Townsend), of which the female has not been seen but the male of which has rather small rounded abdominal hair-patches fitting Mesnil's description of *dilaticornis*; on the other hand, the ocular axis being well below the antennal axis suggests affinity with forms having the bifurcate type of aedeagus.

***Palexorista bisetosa* (Baranov, 1932)**

(Text-fig. 13)

Sturmia bisetosa Baranov, 1932 : 75. Holotype ♂, FORMOSA. In Deutsches Entomologisches Institut. [Examined]

Drino (Prosturmia) bisetosa (Baranov) Mesnil, 1949 : 21.

Palexorista bisetosa (Baranov) Crosskey, 1966 : 135.

♂ [holotype]. Head profile as in Text-fig. 13, frontal length about 1.27 times as great as facial length, antennal axis almost level with ocular axis. Vertex 0.31 of head-width. Upper occiput with a row of black setulae behind postocular row. Interfrontal area slightly wider than parafrontal. Outer vertical setae strongly developed [setae themselves missing on holotype but large pores conspicuous]. Parafrontals yellowish white, colour not noticeably contrasting with creamy whitish pollinose face and parafacials. Parafacials very slightly wider than third antennal segment, with only very few small hairs on about uppermost quarter. Antennae short, third segment 2.3 times as long as second segment and entirely blackish brown. Palpi mostly dark brown, only tawny yellowish on tips. Mesonotum rather greased in holotype but pollinosity apparently mostly pale greyish with little or no trace of a yellow tinge. Tarsal claws very short, much shorter than fifth tarsal segment. Abdomen with mainly dark ground colour but with pale reddish tinge antero-laterally, pollinosity very pale greyish yellow, T₄ dark on about posterior quarter. Dorsal hair of T₄ in about six series; discal setae of T₅ strong. Hair-patches of venter of T₄ very large, each occupying almost three-quarters of width of one side of T₄ venter. [Genitalia missing from holotype: see discussion]. Length 8.2 mm.

♀. Unknown.

Material examined. Holotype ♂. FORMOSA: Sokutsu, ix.1912 (*H. Sauter*).

Distribution. Known only from Formosa.

Hosts. Unknown.

P. bisetosa is still known only from the male holotype, the genitalia of which appear to be lost: they were probably slide-mounted by Baranov, following his normal practice, but the slide cannot now be found in the collection of the Deutsches Entomologisches Institut or in the Baranov collection now at U.S. National Museum. From Baranov's (1932) figure of the lateral view of the hypopygium it is clear that the aedeagus of *bisetosa* is of the non-bifurcate type and that the paralobes and mesolobes in profile are long, slender and pointed: the figure suggests a similarity to *P. curvipalpis* (Wulp), and it is probable that *P. bisetosa* is more closely related to

this species than to others of the genus (it resembles *curvipalpis* also in the short antennae and rather wide frons). The presence of strong outer vertical setae distinguishes *bisetosa* (presuming this character of the holotype holds generally for the species) from all other Oriental species of *Palexorista*, and together with the very short male claws, makes *bisetosa* a distinctive species.

Palexorista curvipalpis (Wulp, 1893)

(Text-figs. 15, 28, 46, 63)

Crossocosmia curvipalpis Wulp, 1893 : 162. Lectotype ♂, JAVA. In Zoologisch Museum, Amsterdam. [Examined]

Sturmia unisetosa Baranov, 1932 : 75. Lectotype ♂, FORMOSA. In Deutsches Entomologisches Institut. [Examined] **syn. n.**

Drino (Prosturmia) unisetosa (Baranov) Mesnil, 1949 : 28.

Palexorista curvipalpis (Wulp) Crosskey, 1966 : 135.

Palexorista unisetosa (Baranov) Crosskey, 1966 : 136.

Lectotype Designations: (1) *Crossocosmia curvipalpis* Wulp. This was described from three syntypes, probably all male; Wulp, at the heading of the specific description, gave the sex as "♂?" but in the same paper gave the sex as male without doubt in the list of figures (the head in lateral view shown in plate 4, figure 3a is of a male). A male specimen seen from Amsterdam Museum bears the label "Crossocosmia curvipalpis ♂" in Wulp's writing and a faded square blue label reading "Java Piepers" and is undoubtedly an original syntype: this specimen has been labelled and is here designated as LECTOTYPE. A female specimen in the Amsterdam collection is labelled "Crossocosmia curvipalpis ♀" in Wulp's writing and also bears a "Java Piepers" label, but both labels are less faded than those on the male: there is no evidence from Wulp's description that he had a female specimen before him at the time of description, and the female is here considered not to be part of the original syntypic series. It should also be noted that the female specimen was misidentified by Wulp, and is not conspecific with the male lectotype of *curvipalpis*: its identity is uncertain, but it belongs to one of the species in which there is a row of black setulae on the upper occiput (absent in *curvipalpis*). (2) *Sturmia unisetosa* Baranov. Type-material consists of three conspecific male syntypes from Kankau, Formosa, one in U.S. National Museum and two in Deutsches Entomologisches Institut (one of which has been labelled and is here designated as LECTOTYPE).

♂. Head profile as in Text-fig. 15, frontal length about 1.23 times as great as facial length, antennal axis only a little above ocular axis. Vertex usually 0.27-0.29 of head-width, in specimens seen from Queensland upper frons very wide and vertex 0.30-0.33 of head-width. Frons usually rather strongly convex, rows of frontal setae with tendency to be doubled. Upper occiput entirely without black setulae behind postocular row. Interfrontal area narrower than or subequal in width to parafrontal. Outer vertical setae undeveloped. Parafrontal hair dense and very fine. Parafrontals and facial regions concolorous silvery or greyish white pollinose, at most only faintly yellowish, the rather uniformly whitish head pollinosity forming characteristic feature of the species. Parafacials broad, distinctly wider than third antennal segment; parafacials nearly bare and often appearing so at first glance, usually with only a very few minute hairs immediately below lowest frontal seta, at most haired only on uppermost fifth and usually on less. Antennae short, third segment 2.1-2.4 times as long as second segment, third segment

usually almost entirely blackish brown but sometimes with orange or reddish suffusion basally. Palpi brown to blackish brown with tawny yellow or pale brownish tips. Mesonotum pale grey or greyish yellow pollinose, more distinctly yellow pollinose in specimens seen from New Guinea and Bougainville. Tarsal claws long. Abdominal ground colour largely blackish brown, sometimes a little reddish on sides of T₃, pollinosity greyish or yellowish white to pale yellow with slightly shifting appearance on intermediate tergites, dark hind margin of T₄ occupying about posterior third or two-fifths of tergite. Dorsal hair of T₄ in about six to nine or ten series, usually fewer series in smaller specimens; discal setae of T₅ strong. Hair-patches of T₄ venter large, as in Text-fig. 28. Genitalia: aedeagus of non-bifurcate type; paralobes without apical spinules, paralobes and mesolobes in lateral view as in Text-fig. 46; mesolobes in posterior view with acuminate apices (Text-fig. 63). Length variable, usually about 8–10.5 mm., ranging from 7–12 mm. with exceptional bred specimens seen from Thailand as small as 5 mm., 10.2 mm. for lectotype of *unisetosa* and 11.1 mm. for lectotype of *curvipalpis*.

♀. Vertex 0.30–0.31 of head-width, 0.34 in specimen seen from Queensland. Third antennal segment 2.2–2.4 times as long as second segment. Interfrontal area noticeably narrower than parafrontal. Parafrontals strikingly silvery white pollinose like facial regions. Upper occiput sometimes with a very few haphazard black setulae. Dorsal hair of T₄ in about five or six series.

Puparium: slits of posterior spiracles not or only slightly sinuous, surface hairs not at all spiniform.

Material examined. Lectotype of *curvipalpis* ♂. JAVA: no locality (*Piepers*). Lectotype of *unisetosa* ♂. FORMOSA: Kankau, Koshun, 7.viii.1912 (*H. Sauter*), bearing erroneous determination label reading "Phorcida idonea B.B. L. Mesnil det."

Paralectotype ♂ of *unisetosa*. FORMOSA: Kankau, Koshun, 7.ix.1912 (*H. Sauter*) (D. Ent. Inst.).

Other material. CEYLON: 1 ♂, 6 ♀, Peradeniya, ex Sphingid, 2.ii.1926 (*J. C. Hutson*); 1 ♂ with puparium, Suduganga, bred from *Suana concolor*, 21.vi.1922 (*R. Senior White*); 1 ♂, Trincomali, 9.x.1890 (*Yerbury*). THAILAND: 2 ♂, 2 ♀, Siam, Bangkok, 1947 (*C. Tongyai*). JAVA: 1 ♂, Buitenzorg, 1921 (Rijksmuseum Leiden). CELEBES: 2 ♂, Minahassa, 27.vi.1954 (*A. H. G. Alston*); 1 ♂, Minahassa, Makawidei, 23–24.vi.1954 (*A. H. G. Alston*); 1 ♂, Molino, 4,000 ft., i.1936 (*L. E. Cheesman*). NEW GUINEA: 1 ♂, Papua, Northern District, Popondetta, Papuan Agricultural Training Institute, 10.i.1966 (*S. Ino & B. Kearo*); 1 ♂, Morobe District, Wau, 3,500–4,000 ft., 14.v.1965 (*R. W. Crosskey*); 1 ♂, Morobe District, nr Wau, Nami Creek, 5,500 ft., 22.v.1965 (*R. W. Crosskey*). NEW BRITAIN: 1 ♂, Keravat, ex larva *Hippotion celerio*, 4.i.1941 (*J. L. Froggatt*). BOUGAINVILLE: 1 ♂, 1 ♀, Aropa area, 12 m. S. of Kieta, 8–10.vii.1965 (*R. W. Crosskey*); 1 ♀, Arawa, 4–7 m. N. of Kieta, 8–9.vii.1965 (*R. W. Crosskey*). SOLOMON ISLANDS: 1 ♀, Santa Cruz group, Utupua Island, vi.1933 (*R. J. A. W. Lever*). QUEENSLAND: 1 ♂, Biloela, 1.iii.1932, on Sphingid (*D. O. Atherton*); 1 ♂, North Queensland, Stannary Hills, c. 3,000 ft. (*T. L. Bancroft*); 11 ♂, 2 ♀, no locality, ii.1903.

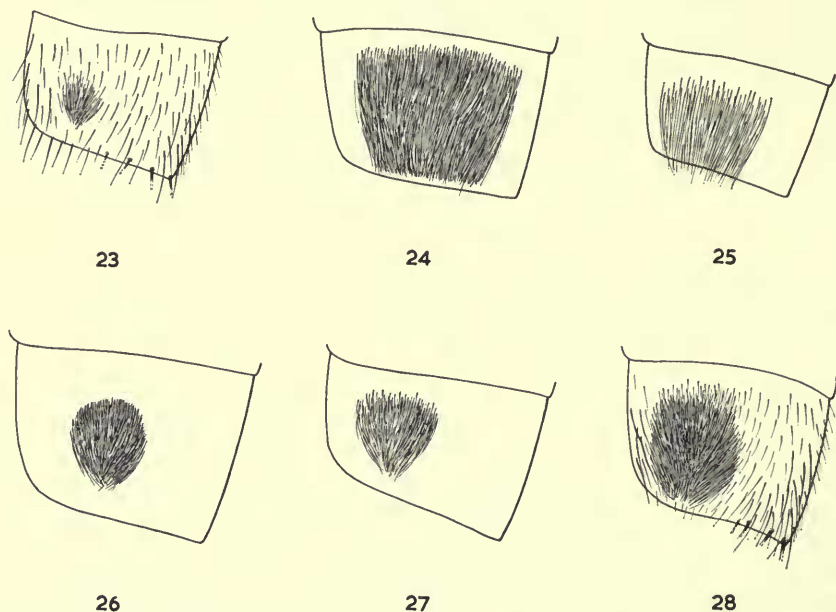
All foregoing material in British Museum (Natural History) except where otherwise indicated.

Distribution. Evidently a widespread species from Ceylon through south-east Asia to New Guinea, Queensland and the Solomon Islands and probably commoner than the few records suggest.

Hosts. *P. curvipalpis* has been reared from *Hippotion celerio* (Linnaeus) (Lepi-

doptera : Sphingidae) in New Britain and from unidentified Sphingids in Ceylon and Queensland; one specimen has been seen bred from *Suana concolor* (Walker) (Lepidoptera : Lasiocampidae) in Ceylon.

Wulp (1893), in the original description of *Crossocosmia curvipalpis*, recorded the host of the type-material as *Hyphaetra remosa* Hbn.: Lepidoptera specialists in British Museum (Natural History) have been unable to trace a *remosa* of Huebner under this or a similar spelling, and the identity of the host recorded by Wulp is enigmatic.



FIGS. 23-28. Showing hair-patch of one side of venter of T4 in male of: 23, *P. solennis*; 24, *P. lucagus*; 25, *P. parachrysois*; 26, *P. summaria*; 27, *P. painei*; 28, *P. curvipalpis*. Ordinary hairing of tergite and bases of marginal setae omitted in figs. 24-27. Hair-patch in male of species not illustrated is generally similar to that of *curvipalpis* 28, or slightly larger.

Mesnil (1951 : 162) suggested the possible synonymy of *curvipalpis* with *Drino argenteiceps* (Macquart), but present examination of the lectotype of *curvipalpis* does not confirm this; *curvipalpis* is without doubt an older name for *unisetosa* Baranov and a valid species of *Palexorista* Townsend.

Palexorista ophirica (Walker, 1857)

(Text-figs. 14, 47, 64)

Tachina ophirica Walker, 1857 : 19. Lectotype ♂, MALAYA. In British Museum (Natural History), London. [Examined]

Blepharipoda ophirica (Walker) Austen, 1907 : 340.

Palexorista ophirica (Walker) Crosskey, 1966 : 136.

Lectotype Designation: the type-material is male, not female as stated in error

by Walker, and consists of two conspecific male syntypes from Mt. Ophir. One of the syntypes has been labelled and is here designated as LECTOTYPE.

♂. Head profile as in Text-fig. 14, frontal length about 1.30 times as great as facial length, profrons rather prominent, antennal axis distinctly above ocular axis. Vertex 0.26-0.28 of head-width. Upper occiput with an irregular row of black setulae behind postocular row. Interfrontal area subequal in width to parafrontal. Parafrontals pale yellowish grey or very pale yellow pollinose, not noticeably contrasting with greyish or silvery white or creamy whitish pollinose face and parafacials. Parafacial at mid height slightly wider than third antennal segment, parafacials slightly more receding than in most species and rather conspicuously haired on uppermost third or upper half. Antennae of medium length, third segment 2.3-2.4 times as long as second segment and entirely blackish brown. Palpi mainly yellowish brown or darker brown basally. Mesonotum pale yellowish grey pollinose, sometimes more distinctly pale yellowish pollinose especially near scutellum. Tarsal claws long, longer than last tarsal segment. Abdomen mainly dark in ground colour but with a trace of reddish or tawny orange ground colour antero-laterally with yellowish white or greyish white pollinosity with rather shifting appearance on intermediate tergites, these appearing black to naked eye on about posterior half. Hair of tergites rather fine and abundant, hair of T₄ in about nine to eleven series; discal setae of T₅ strong. Hair-patches of T₄ venter large, similar to those of *curvipalpis* (Text-fig. 28). Genitalia: aedeagus of non-bifurcate type, similar to that of *immersa* (Text-fig. 35); paralobes without spinules, paralobes and mesolobes rather long and in profile as in Text-fig. 47; mesolobes subtruncate in posterior view (Text-fig. 64). Length about 9-11 mm.

♀. Unknown.

Material examined. Lectotype ♂. MALAYA: Malacca, Mt. Ophir, 4,000 ft. (*A. R. Wallace*).

Paralectotype ♂. Data as for lectotype (B.M. Nat. Hist.).

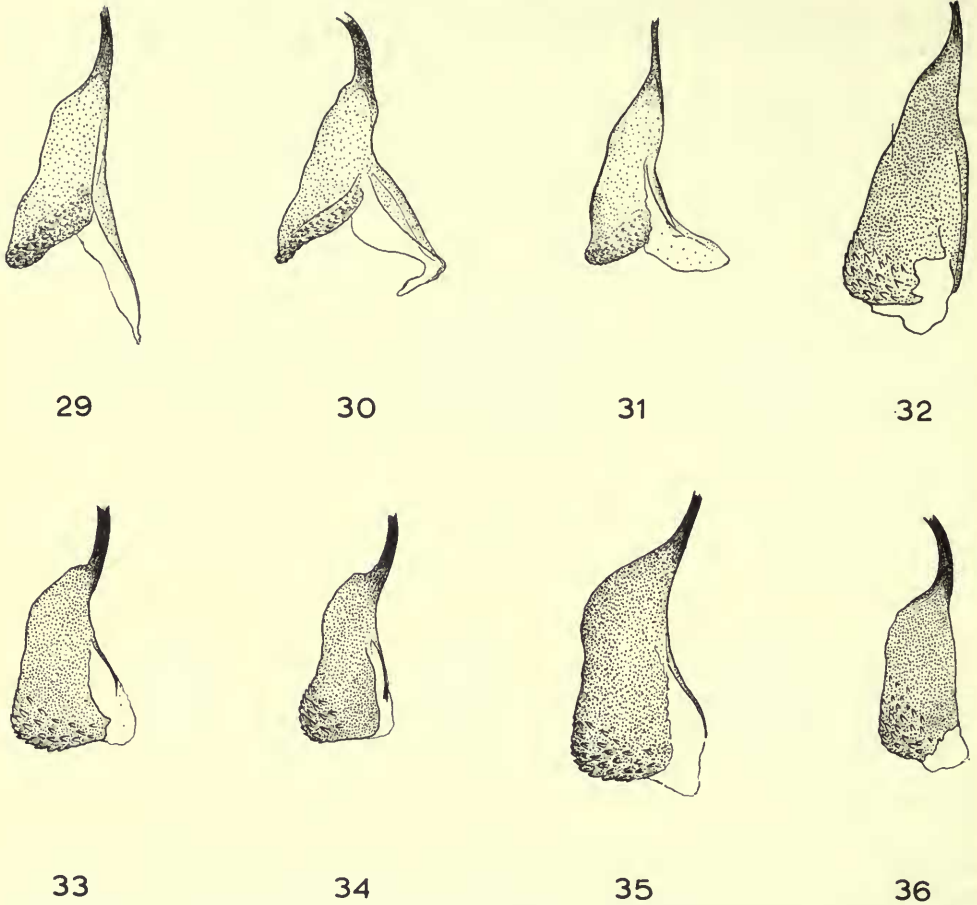
Other material. MALAYA: 1 ♂, Serdang, 5.i.1933 (*G. H. Corbett*) (B.M. Nat. Hist.). INDONESIA: 2 ♂, West Java, Mt. Gede, Lebak Sive, 5,000 ft., ix.1937 (B.M. Nat. Hist.).

Distribution. Known only from Malaya and Java. The specimens from Java listed above differ slightly from the type-material in having rather finer but shorter and denser hair on the mesonotum and abdomen, but it appears best to regard them as conspecific with the type-material from Malaya on present evidence.

Hosts. The Malayan specimen listed above from Serdang and collected by Corbett was reared from *Hulodes caranea* (Cramer) (Lepidoptera: Noctuidae), and is the basis of an erroneous record by Corbett & Miller (1933: 11) of this noctuid as host of *Sturmia inconspicuoides* (the specimen bears an incorrect determination label of Baranov identifying it as *inconspicuoides*).

The record of *ophirica* as a parasite on *Tiracola plagiata* (Walker) in Malaya by Corbett & Miller (1928: 417), again recorded by Greenstreet & Lambourne (1933: 43), is in error and due to misidentification of the species of *Palexorista* involved (see under the "Hosts" section for *P. subanajama*). At present *Hulodes caranea* is the only established host for the true *P. ophirica*.

The affinities of *Palexorista ophirica* appear to be most closely with *P. immersa* and *P. summaria*, to judge from the male hypopygium, all three species having the unusually truncate mesolobes (in posterior view); the head profile is distinctly different, however, from these two species and *ophirica* is certainly more distinct from either than *immersa* and *summaria* are from each other.



FIGS. 29-36. Apex of male aedeagus of: 29, *P. laxa*; 30, *P. inconspicuoides*; 31, *P. lucagus*; 32, *P. sororcula*; 33, *P. summaria*; 34, *P. immersa*; 35, *P. deducens*; 36, *P. painei*. Figs. 29-31 illustrate the "bifurcate" type of aedeagus, and figs. 32-36 the "non-bifurcate" type.

***Palexorista immersa* (Walker, 1860)**

(Text-figs. 17, 34, 49, 65)

Masicera immersa Walker, 1860 : 124. Holotype ♂ [not ♀], CELEBES. In British Museum (Natural History), London. [Examined]

Blepharipoda immersa (Walker) Austen, 1907 : 340.

Sturmia latiforceps Baranov, 1932 : 78. Lectotype ♂, FORMOSA. In Deutsches Entomologisches Institut. [Examined] **syn. n.**

Drino (Prosturmia) latiforceps (Baranov) Mesnil, 1949 : 21.

Palexorista immersa (Walker) Crosskey, 1966 : 136.

Palexorista latiforceps (Baranov) Crosskey, 1966 : 136.

Lectotype Designation: the type-material of *Sturmia latiforceps* Baranov consists of twelve conspecific male syntypes from Formosa, two in U.S. National Museum,

one in British Museum (Natural History), and nine in Deutsches Entomologisches Institut (of which one has been labelled and is here designated as LECTOTYPE): Baranov mentioned 13 males in the original description, but the whereabouts of one of these has not been traced. It should be noted that most of the syntypes lack the abdomen or male hypopygium, and that no slide mounts of the genitalia appear to exist either in Deutsches Entomologisches Institut collection or with the Baranov collection in Washington.

♂. Head profile as in Text-fig. 17, frontal length about 1.30 times as great as facial length, antennal axis only very slightly above ocular axis. Vertex 0.28–0.30 of head-width (0.29 in *immersa* holotype and *latiforceps* lectotype). Upper occiput with an irregular row of black setulae behind postocular row, sometimes sparse or even represented by only one or two hap-hazard setulae. Interfrontal area subequal to or slightly narrower than parafrontal. Outer vertical setae undeveloped. Parafrontals greyish white (as in *immersa* holotype and *latiforceps* lectotype) to pale yellowish grey pollinose and not contrasting with white pollinose face and parafacials, in material seen from New Guinea the parafrontals pale golden yellow and strikingly contrasting with whitish pollinose facial regions. Parafacials subequal in width to third antennal segment or slightly wider, sparsely haired only on about uppermost fifth or sixth or at most on upper quarter. Antennae long, third segment about 3.1 times as long as second segment and all blackish brown (trace of orange colour as usual at junction with second segment). Palpi pale brown to blackish brown, sometimes paler at tips. Pollinosity of mesonotum usually pale greyish or yellowish grey, brassy yellow in specimens seen from New Guinea. Tarsal claws long. Abdomen with mainly dark ground colour, sometimes rather reddish orange laterally on T₃, pollinosity usually yellowish or greyish white, pattern on dorsum of intermediate tergites not very noticeably shifting, T₃ blackish to naked eye on about hind two-fifths, T₄ pollinose on anterior three-quarters or two-thirds and black usually on only about hindmost quarter; specimens seen from New Guinea with golden yellow pollinosity and wider dark hind border to T₄. Dorsal hair of T₄ in about eight to eleven series, discal setae of T₅ short, strong and rather numerous posteriorly. Hair-patches of T₄ venter large and dense, similar to those of *curvipalpis* (Text-fig. 28). Genitalia: aedeagus of non-bifurcate type (Text-fig. 34); paralobes without spinules, paralobes and mesolobes both unusually short and broad in lateral view (Text-fig. 49); mesolobes truncate apically in posterior view (Text-fig. 65). Length about 8–11 mm., usually about 9 mm.

♀. Vertex about 0.30 of head-width. Third antennal segment 2.6–2.8 times as long as second segment. Dorsal hair of T₄ in about seven or eight series. [Note: bred material not available, correct association of wild caught specimens with ♂ assumed from identity of data.]

Material examined. Holotype of *immersa* ♂. CELEBES: Macassar (*A. R. Wallace*). Lectotype of *latiforceps* ♂. FORMOSA: Kankau, Koshun, 7.viii.1912 (*H. Sauter*). Paralectotypes of *latiforceps*. FORMOSA: 1 ♂, Kankau, ix.1912 (*H. Sauter*) (B.M. Nat. Hist.); 2 ♂, Sokutsu, ix.1912 (*H. Sauter*) (D. Ent. Inst.); 4 ♂, Kankau Koshun, 7.viii.1912 (*H. Sauter*) (D. Ent. Inst.); 1 ♂, Kankau, Koshun, v.1912 (*H. Sauter*) (D. Ent. Inst.); 1 ♂, Kankau, Koshun, iv.1912 (*H. Sauter*) (D. Ent. Inst.).

Other material. NEW GUINEA: 1 ♂, 1 ♀, Papua, Kokoda, 1,200 ft., vii–x.1933 (*L. E. Cheesman*) (B.M. Nat. Hist.); 1 ♂, Morobe District, Wau, 3,500–4,000 ft., 18.v.1965 (*R. W. Crosskey*) (B. M. Nat. Hist.). FORMOSA: 1 ♀, Kankau, Koshun, 7.viii.1912 (*H. Sauter*) (D. Ent. Inst.: misidentified syntype of *inconspicuides*).

In addition to the foregoing one female probably belonging to this species: NEW BRITAIN: Keravat, 1.vii.1965 (*R. W. Crosskey*) (B.M. Nat. Hist.).

Distribution. Known only from above-listed material from Formosa, Celebes and the Territory of Papua and New Guinea.

Hosts. Unknown.

This is a distinctive species, easily recognized in the male by the short and very broad paralobes and mesolobes (to which Baranov's name *latiforceps* refers), a character shared only with *P. summaria*—which may not be specifically distinct (see under discussion of that species). Austen (1907 : 340) synonymized *immersa* Walker with *ophirica* Walker, but examination of the type-material (including the male genitalia) for the present revision has shown that this synonymy was wrongly established.

Palexorista summaria (Townsend, 1927)

(Text-figs. 18, 26, 33, 50, 66)

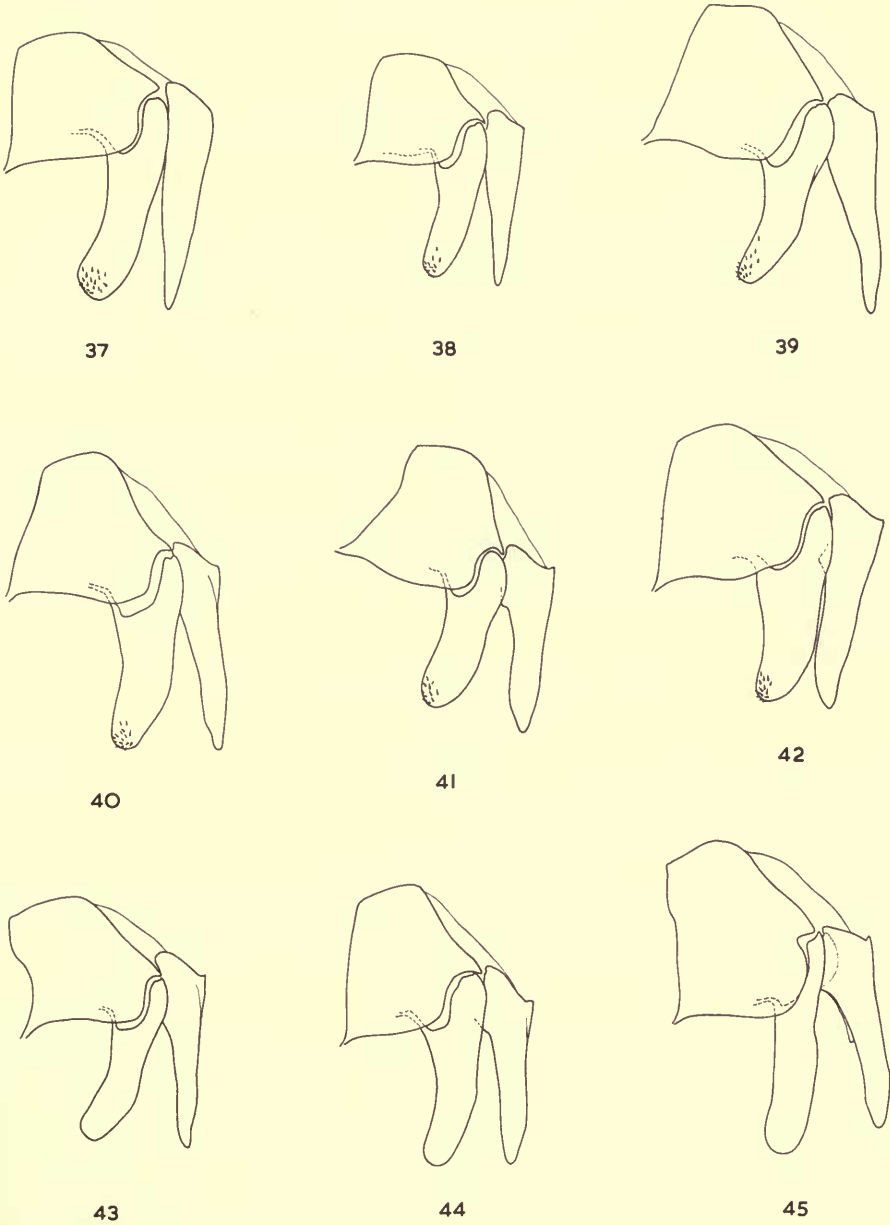
Sumatrodoria summaria Townsend, 1927 : 64. Lectotype ♀ [see note below], SUMATRA.

Possibly lost [male paralectotypes examined].

Palexorista summaria (Townsend) Crosskey, 1966 : 136.

Nomenclatural note: *Sumatrodoria summaria* was originally described from four male syntypes and one female syntype, all from Fort de Kock, Sumatra. In later treatment of the genus *Sumatrodoria* Townsend, of which *summaria* is type-species, Townsend (1941, *Man. Myiol.* 11 : 201) cited "Ht [=holotype] female, At male" and mentioned male paratypes in Washington and Leiden. As the type-series contained only a single female, Townsend (1941) provides a nomenclaturally valid restriction of the name to a single specimen and the female must be accepted as lectotype by restriction of Townsend. This is unfortunate, since the female lectotype cannot now be found in Amsterdam Museum and in any case the female sex carries no satisfactory specific characters. One of the male paralectotypes is in the Zoölogisch Museum, Amsterdam and one in the U.S. National Museum, Washington, and the following description is based on these specimens. I have been unable to trace the whereabouts of the female lectotype, which must be considered possibly lost.

♂. Head profile as in Text-fig. 18, frontal length about 1.25 times as great as facial length, antennal axis only very slightly above ocular axis. Vertex 0.31 of head-width, upper frons rather broad. Upper occiput with a sparse row of black setulae behind postocular row. Interfrontal area subequal in width to a parafrontal. Outer vertical setae undeveloped. Parafrontals greyish white pollinose and not contrasting in colour with white pollinose face and parafacials. Parafacial at mid height about as wide as third segment of antenna, with sparse long hair on about uppermost quarter. Antennae long, third segment about 3.3 times as long as second segment and entirely blackish brown. Palpi dark brown, tips slightly paler. Mesonotum with pale greyish pollinosity, trace of yellowish brown pollinosity near scutal vittae. Tarsal claws long, slightly longer than last tarsal segment. Abdomen with mainly dark ground colour, reddish brown laterally on T₃, pollinosity whitish with slight shifting appearance, to naked eye T₃ mainly dark with pollinosity confined narrowly to anterior border, T₄ pollinose on about basal half with posterior half blackish. Dorsal hair of T₄ in about nine or ten series; discal setae of T₅ numerous, short and strong. Hair-patches of T₄ venter unusually small (Text-fig. 26), less than half as wide as half-tergite venter and very compact. Genitalia: aedeagus of non-bifurcate type, as in Text-fig. 33; paralobes and mesolobes short and very broad in



FIGS. 37-45. Paralobes and mesolobes of male hypopygium in profile of: 37, *P. subanajama* lectotype; 38, *P. lucagus*; 39, *P. aequalis*; 40, *P. munda*; 41, *P. inconspicuooides*, paralectotype; 42, *P. laetifica*; 43, *P. solennis*, from lectotype of *discreta*; 44, *P. laxa*; 45, *P. reclinata*, paratype.

lateral view (Text-fig. 50), paralobes without spinules; mesolobes subtruncate in posterior view (Text-fig. 66). Length about 9 mm.

♀. Characters not known, probably not distinguishable from that of *immersa* [female lectotype not seen, whereabouts unknown, no other female material available and no characters of value mentioned in very brief original description of Townsend].

Material examined. Paralectotypes. 2 ♂, SUMATRA: Fort de Kock, 920 m., 1925 and 1926 (*E. Jacobson*) (U.S. Nat. Mus. & Zool. Mus. Amsterdam).

Distribution. Known only from the type-series from Sumatra.

Hosts. Unknown.

Palexorista summaria is very closely allied to *P. immersa* (Walker) and there is a strong similarity in the unusually short and broad paralobes and mesolobes: it is possible that *summaria* is not specifically distinct from *immersa*, but I maintain it as a separate species at present because of the slightly wider male frons, the conspicuously smaller and more compact abdominal hair-patches and minor differences in the shape of the mesolobes in posterior view.

Baranov (1934a) synonymized *summaria* with *Drino (Zygobothria) atropivora* (Robineau-Desvoidy, 1830) and the synonymy—following Baranov—was later recorded by Mesnil (1949: 12, 1951: 168). The type-material of *summaria* shows very small ocellar setae and hairing on the upper part of the parafacials (characters of *Palexorista*), and the synonymy of *summaria* with *atropivora* established by Baranov is incorrect (*atropivora* is a true *Zygobothria* in which the ocellar setae are strong and the parafacials wholly bare).

Palexorista deducens (Walker, 1860)

(Text-figs. 16, 35, 48, 71)

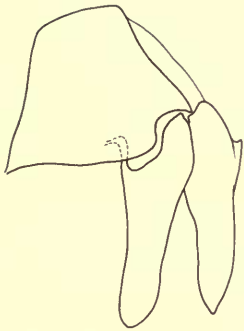
Eurygaster deducens Walker, 1860: 127. Lectotype ♂, CELEBES. In British Museum (Natural History), London. [Examined]

Exorista deducens (Walker) Wulp, 1896: 130.

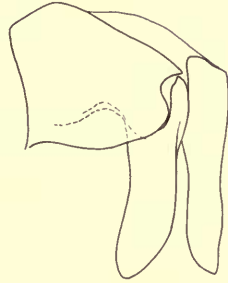
Palexorista deducens (Walker) Crosskey, 1966: 135.

Lectotype Designation: the type-material of *deducens* is male, not female as stated in error by Walker, and consists of two conspecific male syntypes from Macassar, one of which has been labelled and is here designated as LECTOTYPE.

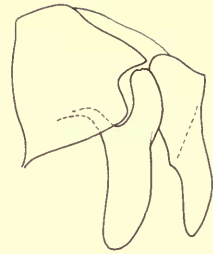
♂. Head profile as in Text-fig. 16, frontal length about 1.23 times as great as facial length, antennal and ocular axes coincident. Vertex 0.23–0.25 of head-width, upper frons narrower than usual. Upper occiput with a row of black setulae behind postocular row, irregular and sometimes sparse. Interfrontal area slightly narrower than a parafrontal. Outer vertical setae undeveloped. Parafrontals yellow pollinose and slightly contrasting with yellowish white pollinose face and parafacials in type-material from Celebes, parafrontals pale greyish and not contrasting with whitish pollinose facial regions in specimens seen from Buru. Facial region rather flat and in facial view more widely diverging towards vibrissae than in most species. Parafacials slightly narrower than or subequal in width to third antennal segment, conspicuously haired on uppermost third or on upper half (as in lectotype). Antennae very short, third segment 2.1–2.2 times as long as second segment and entirely blackish brown. Palpi brown with yellowish apices. Mesonotum pale yellow grey or greyish pollinose in material seen from Buru, pale golden pollinose in type-material, scutum of lectotype with traces of golden brown pollinosity



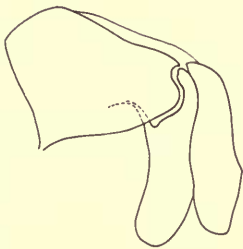
46



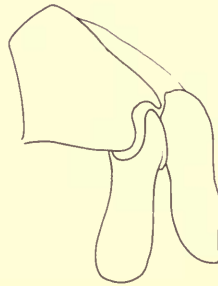
47



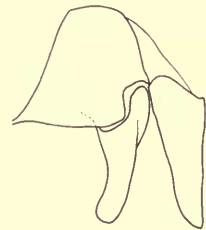
48



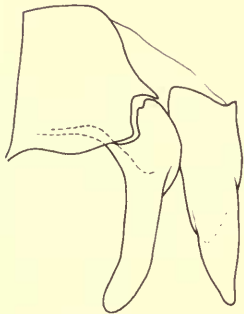
49



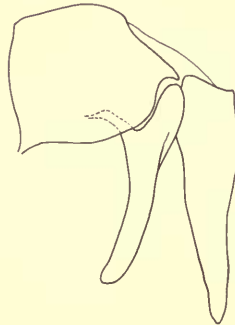
50



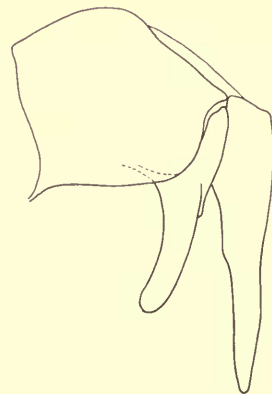
51



52



53



54

FIGS. 46-54. Paralobes and mesolobes of male hypopygium in profile of: 46, *P. curvipalpis*, lectotype; 47, *P. ophirica*, paralectotype; 48, *P. deducens*, lectotype; 49, *P. immersa*, from paralectotype of *latiforceps*; 50, *P. summaria*, paralectotype; 51, *P. painei*; 52, *P. parachryscps*; 53, *P. sororcula*, holotype; 54, *P. bancrofti*, holotype.

around sublateral pair of scutal vittae. Tarsal claws long. Abdomen with dark ground colour, trace of reddish ground colour laterally on T₃ in Buru specimens, pollinosity whitish in Buru specimens and pale yellow in type-material, only a weak shifting appearance, pollinosity of T₄ on about basal half or three-fifths so that hind margin is broadly black. Dorsal hair of T₄ in about seven or eight series, discal setae of T₅ moderately strong. Hair-patches of T₄ venter large, similar to those of *curvipalpis* (Text-fig. 28) or slightly smaller. Genitalia: aedeagus of non-bifurcate type (Text-fig. 35); paralobes without spinules, mesolobes short and with characteristic curvature in lateral view (Text-fig. 48); mesolobes in posterior view with bluntly and evenly rounded tips (Text-fig. 71). Length about 8 mm.

♀. Unknown.

Puparium: posterior spiracles on unusually large trifold bosses, spiracular slits long and very strongly serpentine, surface hairs of puparium short and dense and not at all spiniform.

Material examined. Lectotype ♂. CELEBES: nr Macassar, 1857-58 (*A. R. Wallace*).

Paralectotype ♂. Data as for lectotype (B.M. Nat. Hist.).

Other material. BURU: 2 ♂, Station 1, 1921 (*L. J. Toxopeus*) (B.M. Nat. Hist.).

Distribution. Known only from above-listed material from Celebes and Buru in eastern Indonesia.

Hosts. Unknown. The specimens from Buru have the associated puparia and are therefore reared material but there is no host information on the data labels.

Palexorista deducens is a distinctive species easily recognized by the form of the mesolobes of the male hypopygium and by the distinctive puparium in which the posterior spiracular slits are very strongly serpentine (this character may possibly be found to occur in other species for which the puparium is at present unknown, but *deducens* is the only species of *Palexorista* known to me at this time to possess this character).

Palexorista parachrysops (Bezzi, 1925)

(Text-figs. 20, 25, 52, 68)

Sturmia parachrysops Bezzi, 1925 : 114. Lectotype ♂, MALAYA. In British Museum (Natural History), London. [Examined]

Drino (Prosturmia) parachrysops (Bezzi) Mesnil, 1951 : 194.

Palexorista parachrysops (Bezzi) Crosskey, 1966 : 136.

Lectotype Designation: this species was described from four specimens, referred to by Bezzi as type ♀, type ♂, and as two additional specimens with sex not stated. The syntypes with stated sex are both in British Museum and the male has been labelled and is here designated as LECTOTYPE: the whereabouts of the other two syntypes is not known. It should be noted that the male lectotype and the female paralectotype are both labelled with the name and sex in Bezzi's writing and that the female lacks the abdomen.

♂. Head profile as in Text-fig. 20, frontal length about 1.22 times as great as facial length, antennal axis only slightly above ocular axis. Vertex 0.30-0.31 of head-width. Frons with fewer pairs of frontal setae than usual, only about five or six pairs (sometimes with tendency to be in doubled rows), uppermost pair of frontals sometimes directed slightly backwards. Upper occiput without black setulae behind postocular row. Interfrontal area usually more reddish or orange than in other species, exceptionally narrow and at narrowest but little or not more than

half as wide as parafrontal at widest. Outer vertical setae undeveloped. Parafrontals pale yellow to golden orange pollinose near the interfrontal area, especially near ocelli, yellowish colour usually mainly along rows of frontal setae, the pollinosity more silvery or creamy white towards the eyes; face and parafacials white pollinose. Parafacials broad, conspicuously wider than third antennal segment; parafacial hair very sparse and inconspicuous, at most on uppermost quarter and sometimes only a single hair or perhaps two immediately below lowest frontal seta. Antennae of medium length, third segment 2.7–2.8 times as long as second segment, the latter rather reddish; third segment extensively yellowish orange basally and along inner edge, otherwise brown. Palpi entirely yellow. Mesonotum with pale greyish yellow pollinosity. Tarsal claws of intermediate length, subequal to last tarsal segment (distinctly longer than in *painei* or *sororcula* but shorter than in most species). Abdomen slightly elongate and tapering, ground colour extensively reddish yellow, blackish medially on T₃ and on hind margins of intermediate tergites, pollinosity pale yellowish white and on T₄ covering most of tergite (only extreme hind border of T₄ narrowly dark brown or blackish). Dorsal abdominal hair rather long and strong but unusually sparse, hair of T₄ in only three or four or at most five series; median marginal setae of T₃ unusually long and strong, discal setae of T₅ few and strong. Hair-patches of T₄ venter very large and loose (Text-fig. 25), at least two-thirds as wide as half-tergite, apices of the hairs overlapping end of tergite. Genitalia: aedeagus of non-bifurcate type, very similar to that of *painei* (Text-fig. 36); paralobes without spinules, in lateral view slender and much narrower than the broad tapering mesolobes (Text-fig. 52); mesolobes in posterior view (Text-fig. 68) with bluntly rounded tips, slit between the free apices much shorter than fused basal part. Small species, length 5.5–7.0 mm., lectotype 6.3 mm.

♀. Vertex 0.31–0.33 of head-width. Third antennal segment 2.4–2.7 times as long as second segment. Head in facial view unusual, inner margins of eyes distinctly concave so that facial region between eyes bows outwards and is widest at about level of end of second antennal segment (Text-fig. 76), facial region thence narrowing slightly towards vibrissae. Interfrontal area very narrow, only half as wide as parafrontal or even less. Parafrontals mainly clear pale yellow to deep golden pollinose, only whitish pollinose at extreme lower ends (usually with whitish pollinosity extending slightly upwards along eye margin). Third antennal segment sometimes largely orange, only brownish apically and along fore border; second antennal segment usually reddish. Dorsal hair of T₄ in only about four series. Pollinosity of mesonotum and abdomen sometimes golden-yellow in African specimens.

Puparium: each part of the trifold boss of posterior spiracles well separated, spiracular slits almost straight, surface hairs moderately long and not thorn-like.

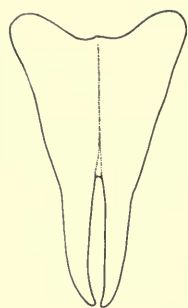
Material examined. Lectotype ♂. MALAYA: Kuala Lumpur, par. on *Psara bipunctalis*, 20.vi.1923 (G. H. Corbett & B. A. R. Gater).

Paralectotype ♀. Data as for lectotype (B.M. Nat. Hist.).

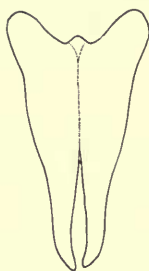
Other material. MALAYA: 1 ♀ with puparium, Kuala Lumpur, parasite of *Psara* sp. (G. H. Corbett). INDIA: 1 ♀, Central Provinces, Hoshangabad, Rahatgaon, par. on *Hapalia machaeralis* larva, 9.viii.1926 (S. N. Chatterjee); 2 ♂, South India, Samasetti, Palayam, par. on *Eublemma* sp., ii.1924 (C. K. S.). CEYLON: 2 ♂, 1 ♀, Trincomali, 5 & 20.vii.1890 (Yerbury); 1 ♀, Suduganga, 30.iii.1919 (R. Senior White). KENYA: 1 ♀, Naivasha, iv.1940 (H. J. A. Turner). GHANA: 1 ♂, 1 ♀, Kumasi, 27.x. and 24.xi.1946 (J. Bowden). MALI: 1 ♀, French Sudan, ex pupae of Lepidoptera (R. Dugast). SENEGAL: 1 ♂, Bambey, ex *Etiella zinckenella*, 22.xii.1942 (J. Risbec); 1 ♀, Bambey, ex Limacodid, 5.i.1943 (J. Risbec); 1 ♀, Bambey (J. Risbec).

All above-listed material in British Museum (Natural History).

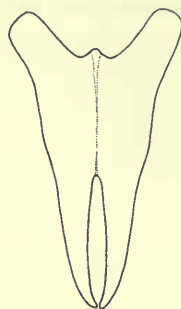
Distribution. *Palexorista parachrysops* occurs from West Africa to Malaya, but records are few, and the species is not yet known from anywhere between Kenya



55



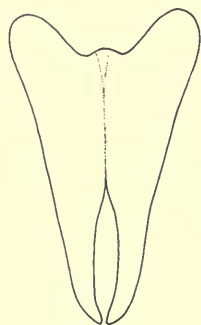
56



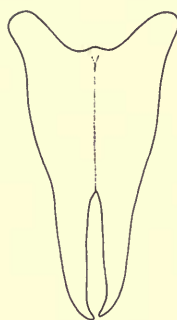
57



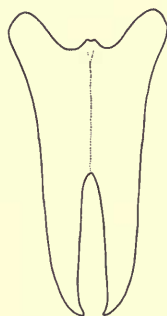
58



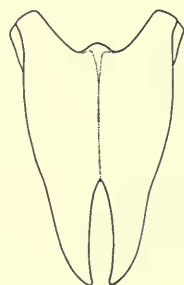
59



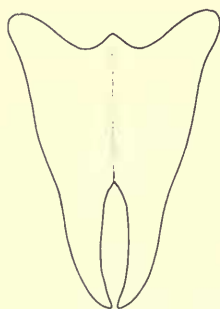
60



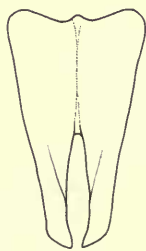
61



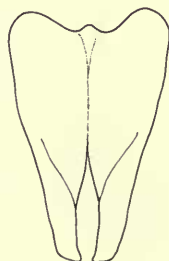
62



63



64



65



66

FIGS. 55-66. Mesolobes of male hypopygium in posterior view of: 55, *P. subanajama*, lectotype; 56, *P. lucagus*; 57, *P. munda*; 58, *P. inconspicuoides*, paralectotype; 59, *P. laetifica*; 60, *P. solennis*, from lectotype of *discreta*; 61, *P. laxa*; 62, *P. reclinata*, paratype; 63, *P. curvipalpis*, lectotype; 64, *P. ophirica*, paralectotype; 65, *P. immersa*, from paralectotype of *latiforceps*; 66, *P. summaria*, paralectotype.

and India. Despite the discontinuity, there is no doubt that African material is conspecific with the type-material from Malaya: the male genitalia of West African specimens agree completely with those of Oriental material, and all other distinctive characters agree also.

Hosts. The hosts of *P. parachrysoys* so far known are all lepidopterous and include an unidentified Limacodid in Senegal, an unidentified species of *Eublemma* (Noctuidae) in southern India, and the following Pyralidae: *Psara bipunctalis* (Fabricius) and *Pyrausta machoeralis* (Walker) in the Pyraustinae from Malaya and India respectively, and *Etiella zinckenella* (Treitschke) in the Phycitinae in Senegal.

P. parachrysoys has been correctly recorded in the literature as a parasite on *Psara bipunctalis* by Bezzi (1925) in the original description and later by Corbett & Miller (1928, 1933), the records being based on material from Malaya where *Psara bipunctalis* is a pest of egg-plant; Beeson & Chatterjee (1935, 1939) correctly record it as a parasite on the caterpillars of *Hapalia machaeralis* (= *Pyrausta machoeralis*), a defoliator of teak in India.

Thompson (1946 : 339) has recorded *parachrysoys* as a parasite on *Leucinodes* sp. (Pyralidae), based on material in British Museum collection: it is not possible to confirm this record, as no material reared from *Leucinodes* can now be found in the B.M. collection.

This species is probably allied to *P. painei* (Baranov) but is easily distinguished from this and other species, apart from male genital characters, by the unusual facial appearance of the female, by the very large and rather shaggy hair-patches of the abdomen of the male (in which the ends of the hairs overlap the following segment, surpassing the end of T4), by the very sparse and strong abdominal hairing, and by the exceptionally narrow interfrontal area in both sexes. The completely yellow palpi are also characteristic.

Palexorista painei (Baranov, 1934)

(Text-figs. 19, 27, 36, 51, 69)

Sturmia painei Baranov, 1934b : 42. Lectotype ♂, JAVA. In British Museum (Natural History), London. [Examined]

Palexorista painei (Baranov) Crosskey, 1966 : 136.

Lectotype Designation: the type-material seen of *Sturmia painei* consists of two male and two female syntypes, with data as stated by Baranov and each labelled " *Sturmia Painei* n. sp. N. Baranoff " in Baranov's writing; all of these syntypes are in British Museum, and one male has been labelled and is here designated as LECTOTYPE. It should be noted that the original description is headed " ♂ ", but that Baranov describes characters of the " Weibchen " in the description, and it is therefore certain that *painei* was based on both male and female syntypes (Baranov does not state the number of specimens seen of either sex).

♂. Head profile as in Text-fig. 19, profrons hardly at all narrower than gena, frontal length about 1.19 times as great as facial length, antennal axis only slightly above ocular axis. Vertex 0.27-0.29 of head-width. Frons usually rather strongly convex. Upper occiput with a row of black setulae behind postocular row. Interfrontal area unusually narrow, parafrontals wider

than normal and interfrontal area at mid point only about half or two-thirds as wide as parafrontal. Outer vertical setae undeveloped. Parafrontal colour unusual, pollinosity brassy yellow to deep golden on about upper third and rather abruptly contrasting with silvery white or creamy white pollinosity on about lower two-thirds; face and parafacials entirely creamy or silvery white pollinose, like the lower parafrontals; ground colour of facial regions reddish. Parafacials a little wider than third antennal segment, haired on uppermost quarter or third. Antennae of medium length, third segment 2.7–2.8 times as long as second segment; second segment more reddish brown than usual, third segment blackish brown or dark brown except for some orange basal suffusion which usually extends slightly along inner edge of segment. Palpi yellow, at most only brownish at extreme base. Mesonotal pollinosity golden yellow, with similar pollinosity on abdomen giving species a distinctly golden appearance. Tarsal claws very small, conspicuously shorter than last tarsal segment. Abdomen with blackish brown ground colour medio-dorsally and along hind margins of intermediate tergites, and with ground colour extensively reddish orange laterally and reddish brown on T₅; abdominal pollinosity golden yellow with little or no shifting appearance, contrasting with blackish hind margins of intermediate tergites, dark hind margin of T₄ occupying about one-third of tergite length. Median marginal setae of T₃ small and inconspicuous; dorsal hair of T₄ in about five to seven series; discal setae of T₅ strong, rather long but not very numerous. Hair patches of T₄ venter of medium size (Text-fig. 27), somewhat less than half width of the half-tergite. Genitalia: aedeagus of non-bifurcate type, as in Text-fig. 36; paralobes without spinules, paralobes and mesolobes short with the former slender and rather narrower than the broad mesolobes in profile (Text-fig. 51); mesolobes in posterior view with bluntly and evenly rounded apices (Text-fig. 69). Length usually about 7 mm., range 5.5–9.1 mm., lectotype 7.4 mm.

♀. Vertex 0.27–0.31 of head-width. Third antennal segment 2.7–3.0 times as long as second segment. Interfrontal area much narrower than parafrontal, at mid height usually about 0.6 of parafrontal width. Parafrontals more extensively yellow than in ♂, about upper half or two-thirds pale yellow pollinose and lower half or lowest third creamy whitish pollinose; face and parafacials less silvery white than in ♂, sometimes pollinosity faintly yellowish white. Dorsal hair of T₄ in only about three or four, at most five, series.

Puparium: slits of posterior spiracles almost completely straight, surface hairing very minute, short and slightly thorn-like.

Material examined. Lectotype ♂. JAVA: no locality, 1929–30, ex *Tirathaba* sp. (*R. W. Paine*).

Paralectotypes. 1 ♂, 2 ♀, data as for lectotype (B.M. Nat. Hist.).

Other material. JAVA: 2 ♂, 5 ♀, Buitenzorg, ex *Tirathaba rufivena*, iii–iv. 1933 (*R. W. Paine*); 1 ♂, Bantam Coast, ii. 1933 (*R. W. Paine*); 1 ♂, 3 ♀, West Java, 1929–30 (*R. W. Paine*); 1 ♂, 1 ♀, W. Java, ex *Tirathaba*, 1929–30 (*R. W. Paine*); 9 ♂, West Coast, ex *Tirathaba*, ii. 1933 (*R. W. Paine*); 1 ♂, Anjer, ex *Tirathaba* sp., v. 1930 (*R. W. Paine*); 1 ♂ with puparium, West coast, ex *Tirathaba* sp., x. 1930 (*R. W. Paine*); 5 ♂, 10 ♀, some with puparia, emerged en route to Fiji, ex *T. rufivena*, vi. 1933 (*R. W. Paine*).

All the above-listed material in British Museum (Natural History).

Distribution. So far as known *Palexorista painei* occurs only in Java. A few specimens were released in Fiji in 1933 (Paine, 1935 : 16), but *painei* almost certainly never became established in Fiji.

Hosts. The only known host is the Coconut Spike Moth, *Tirathaba rufivena* Walker (Lepidoptera : Pyralidae), from which the type-specimens and all other known material were reared. *Palexorista painei* parasitizes the larval stage of *T. rufivena* in Java, and an unsuccessful attempt was made to introduce the species into Fiji

in 1933 for the biological control of the Fijian species of Coconut Spike Moth, *Tirathaba trichogramma* Meyrick (synonym of *T. complexa* Butler) (see Paine, 1935). Paine (op. cit.) records a 1.6% parasitism rate by *painei* on a sample of 3,000 fifth instar larvae of *Tirathaba rufivena* collected in 1933 on the West Coast of Java.

Palexorista painei is one of the most distinctive Oriental species, characterized by the very small claws of the male, the golden pollinose thorax and abdomen, and by the unusual appearance of the parafrontals in which the upper parts are yellow and the lower parts silvery or whitish. The affinities are probably with *P. sororcula* (Mesnil) and possibly *P. parachrysoops* (Bezzi). The head facies of *P. painei* shows a notable likeness to that of some Carceliini, particularly in the genus *Argyrophyllax* Brauer and Bergenstamm, but the puparial characters confirm without doubt its correct assignment to *Palexorista*.

Palexorista sororcula (Mesnil, 1949)

(Text-figs. 21, 32, 67)

Drino (*Prosturmia*) *sororcula* Mesnil, 1949 : 30. Holotype ♂, AUSTRALIA. In Deutsches Entomologisches Institut. [Examined]

Palexorista sororcula (Mesnil) Crosskey, 1966 : 136.

♂ [holotype]. Head profile as in Text-fig. 21, frontal length about 1.29 times as great as facial length, antennal axis almost level with ocular axis. Vertex 0.32 of head-width. Upper occiput of holotype without black setulae on one side but with a few on other (species probably normally without). Interfrontal area at mid point slightly narrower than parafrontal. Parafrontals each with supernumerary row of small frontal setae outside the main row. Outer vertical setae undeveloped. Parafrontals uniformly pale silvery greyish pollinose and not contrasting with slightly more white pollinose face and parafacials. Parafacial subequal in width to third antennal segment, inconspicuously haired on about uppermost quarter. Antennae short, third segment about 2.5 times as long as second segment, second segment unusually reddish and third segment mostly reddish yellow (only brownish apically and along fore border). Palpi yellow. Mesonotum thinly greyish pollinose, not at all yellow. Tarsal claws very small, shorter than last tarsal segment. Abdomen with mainly darkish ground colour and very pale whitish grey pollinosity, T₄ mainly pollinose and without shifting appearance, only apical quarter of T₄ or less black-brown; T₅ pale pollinose on basal three-fifths with pale median pollinose line extending to hind margin of tergite and more or less separating paired postero-lateral dark areas. Dorsal hair of T₄ in about six series; T₅ with very sparse long hair anteriorly merging to distinct discal setae posteriorly. Hair-patch of T₄ venter large, much as in *curvipalpis* (Text-fig. 28). Genitalia: aedeagus (Text-fig. 32) of non-bifurcate type; paralobes and mesolobes as in fig. 53, paralobes slender and narrower than mesolobes, without apical spinules; mesolobes in posterior view very long and subparallel (Text-fig. 67), unfused tips much shorter than fused basal part. Length 6.8 mm.

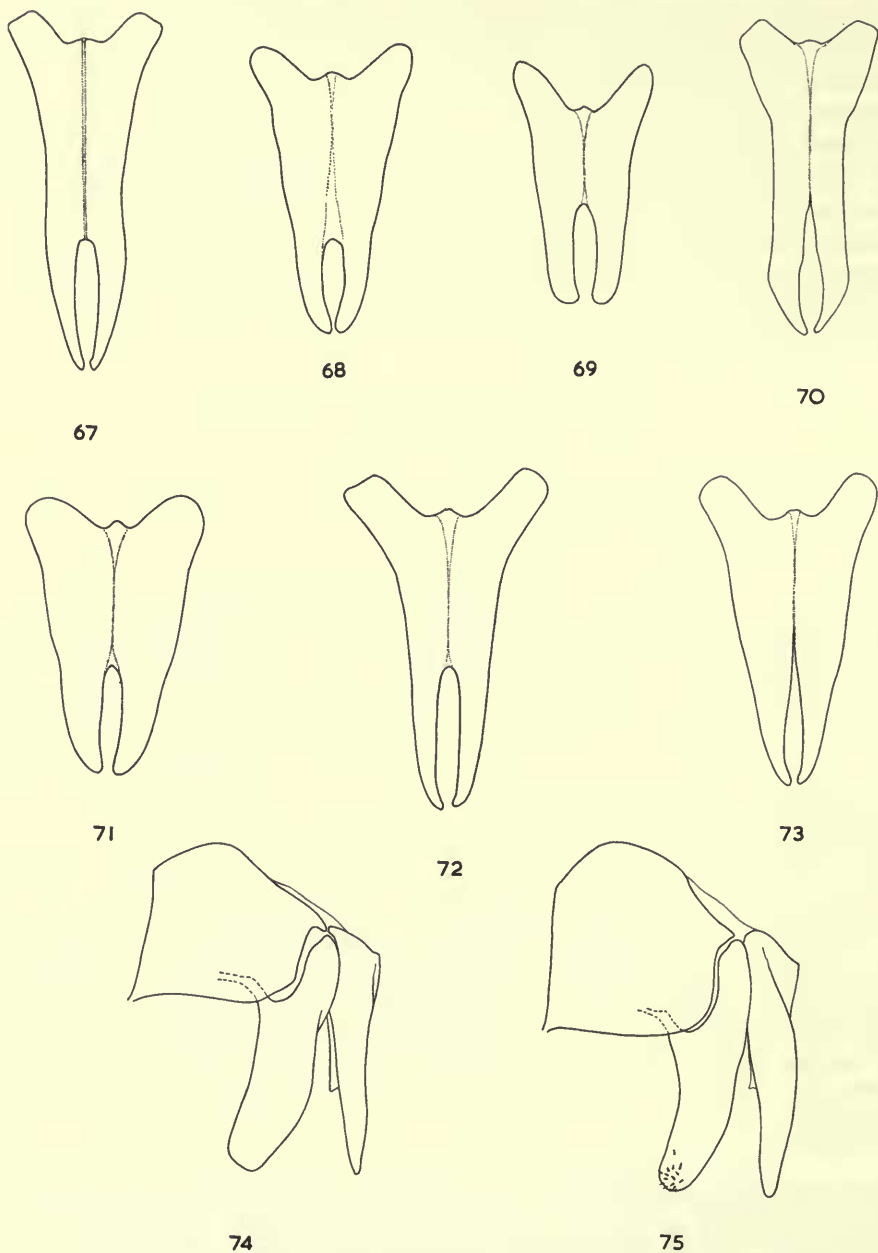
♀. Unknown.

Material examined. Holotype ♂. AUSTRALIA: Queensland, Herberton, 3,700 ft., i. 1911 (*Dodd*) [labelled also "Phorcida sororcula Mesn. L. Mesnil det."].

Distribution. Known only from the holotype from Queensland.

Hosts. Unknown.

This species is probably most closely allied to *P. painei* (Baranov), having a similar head facies, short male claws and similar male hypopygium.

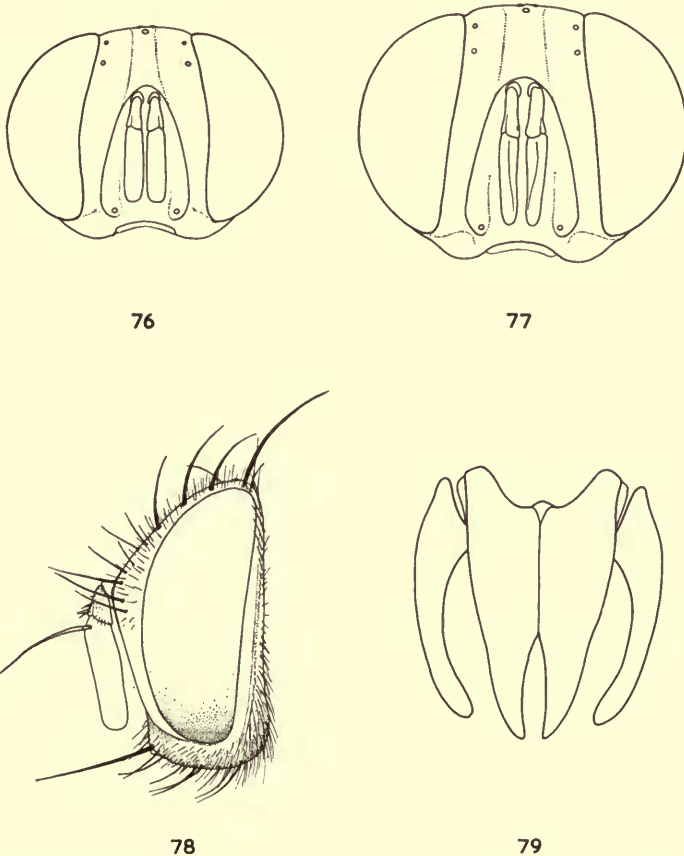


FIGS. 67-75. 67-73, Mesolobes of male hypopygium in posterior view of: 67, *P. sororcula*, holotype; 68, *P. parachrysope*; 69, *P. painei*; 70, *P. bancrofti*, holotype; 71, *P. deducens*, lectotype; 72, *P. imberbis* from Egypt; 73, *P. zonata* from Egypt. 74, 75, Paralobes and mesolobes of male hypopygium in profile of: 74, *P. imberbis* from Egypt; 75, *P. zonata* from Egypt.

Palexorista bancrofti sp. n.

(Text-figs. 22, 54, 70)

♂. Head profile as in Text-fig. 22, frontal length about 1.20 times as great as facial length, antennal axis noticeably above ocular axis. Vertex 0.28–0.29 of head-width. Upper occiput with black setulae behind postocular row. Interfrontal area subequal in width to parafrontal. Outer vertical setae undeveloped. Parafrontals pale yellowish to golden pollinose; face and parafacials whitish pollinose and rather conspicuously contrasting with yellow parafrontals. Parafacials conspicuously wider than third antennal segment, haired on about uppermost third. Antennae long, third segment about 3.1 times as long as second segment and extensively reddish orange basally and posteriorly. Palpi mainly yellow or pale brownish on basal half. Pollinosity of mesonotum pale yellowish to golden, therefore distinctly yellowish species to naked eye. Tarsal claws long, length exceeding that of fifth tarsal segment. Abdomen with rather reddish



FIGS. 76–79. 76, 77, Outline of facial view of head of female of: 76, *P. parachrysofs* showing strongly bowed inner eye margins; 77, other species of *Palexorista*, drawn from *P. lucagus*, in which facial region between eyes widest near vibrissae and inner eye margins not strongly convex. 78, Profile view of head of male of *P. reclinata* showing three pairs of reclinate setae on frons and vibrissae near level of mouth-margin. 79, Posterior view of mesolobes and paralobes of male hypopygium of *P. reclinata* showing unusually convex outer sides of paralobes.

ground colour, especially antero-laterally, and bronze-brown pollinosity over dark areas, T₄ dark on posterior two-fifths; abdominal hair rather long and fine, T₅ without truly developed discal setae but with long strong hair. Dorsum of T₄ with about eight to ten hair series. Hair-patches of T₄ venter large, similar to or a little larger than those of *curvipalpis* (Text-fig. 28). Genitalia: aedeagus of non-bifurcate type, very similar to that of *sororcula* (Text-fig. 32); paralobes unusually short in relation to long mesolobes (Text-fig. 54), without apical spinules, slender in profile; mesolobes in posterior view as in Text-fig. 70. Length about 8–9 mm.

♀. Vertex 0.31 of head-width. Third antennal segment 3.3 times as long as second segment, extensively reddish orange as in ♂. T₅ with unusually weak fine hairing, no short strong discal setae. T₄ dorsally with about eight or nine hair series. Interfrontal area slightly narrower than a parafrontal, more noticeably so than in ♂.

Holotype ♂. QUEENSLAND: Burpengarry (*T. L. Bancroft*). In Australian National Insect Collection, Canberra.

Paratypes. 2 ♂, 1 ♀, data as for holotype (B.M. Nat. Hist.).

Hosts. Lepidoptera: Pyralidae. Holotype and one paratype are labelled "Vict. [=victimising] *Cryptocarya pyrale*" and other two paratypes are labelled "Vict. Blue gum pyrale", but there is no information on the pyralid host species.

The affinities of this species are probably most closely with *P. sororcula* (Mesnil), as shown by the close resemblance in the two species of the aedeagus and hypopygial lobes: *P. bancrofti* is easily distinguishable from *sororcula* by the long tarsal claws of the male and the unusually short paralobes compared to the length of the mesolobes (in other species of *Palexorista* for which the male genitalia are known the paralobes and mesolobes are of much the same length in lateral view).

Palexorista reclinata sp. n.

(Text-figs. 12, 45, 62, 78, 79)

♂. Head profile as in Text-fig. 12, frontal length about 1.12 times as great as facial length, antennal axis distinctly above ocular axis. Frons with a pair of strong reclinate setae immediately below the normal two pairs of reclinate orbital setae, sometimes with yet another pair of smaller reclinate setae below these, frons thus showing in all three pairs of strong subequal reclinate setae (Text-fig. 78) and sometimes a smaller supernumerary fourth pair. Vertex 0.28–0.30 of head-width. Upper occiput without black setulae behind postocular row. Interfrontal area subequal in width to a parafrontal. Outer vertical setae undeveloped. Parafrontals pale yellowish grey or very pale yellowish pollinose, not noticeably contrasting in colour with whitish or yellowish white pollinose face and parafacials. Parafacials conspicuously narrower than third antennal segment, with only a very few small hairs immediately below lowest frontal setae. Vibrissae only very slightly above level of mouth-margin. Gena slightly narrower than pronotum. Antennae long, third segment 4.0–4.4 times as long as second segment and almost entirely blackish brown (trace of orange colour at joint with second segment). Palpi brownish on basal half shading to tawny yellowish on apical half. Pollinosity of mesonotum pale greyish yellow, naked eye appearance more greyish than yellowish species. Tarsal claws and pulvilli very long. Abdomen with mainly dark ground colour largely covered by pale greyish yellow pollinosity, appearance rather greyish to naked eye and trace of fine median blackish line distinct: T₃ and T₄ only very narrowly blackish brown posteriorly, posterior dark marginal band on T₄ not extending forwards much beyond basal of marginal setae. Dorsal hair of T₄ in about six or seven hair series; discal setae of T₅ very strong. Hair-patches of T₄ venter large, similar to those of *curvipalpis* (Text-fig. 28). Genitalia: aedeagus of bifurcate type; paralobes and mesolobes as in Text-figs. 45 and 62, paralobes without apical spinules and in posterior view of hypopygium unusually strongly convex (Text-fig. 79). Length about 7.5–9 mm.

♀. Unknown.

Holotype ♂. S. INDIA: Madura District, Alagar Kovil, 20.iii.1936 (*B.M.-C.M. Expedn. S. India*). In British Museum (Natural History), London.

Paratypes. 4 ♂, data as for holotype (B.M. Nat. Hist.).

Hosts. Unknown.

Palexorista reclinata sp. n. stands rather apart from other species of *Palexorista* because of the additional reclinate setae on the frons, the unusually narrow gena, the vibrissae almost level with the mouth-margin, and the abdominal pollinosity and pattern; in addition, the fourth antennal segment in relation to the second is longer than in other species, and the paralobes of the male hypopygium are more strongly bowed than usual. I am not at all certain that the species should be assigned to *Palexorista*, but this appears to be the best provisional generic placing—at least until the affinities of *reclinata* can be better assessed from knowledge of the female and the hosts, at present unknown. The body facies, particularly the head and antennal proportions, the chaetotaxy of the frons and the appearance of the abdomen suggest that *P. reclinata* may be more closely related to the Carceliini than the Sturmiini, and there is some resemblance to the genus *Argyrophylax* Brauer & Bergenstamm. It may be noted that in all the type-material there is only a single strong postvertical setula on either side of the cerebrale, whereas two or three are usually (though only one occurs exceptionally) present in males of *Palexorista*.

SYNOPSIS OF THE ORIENTAL SPECIES OF *PALEXORISTA*
AND THEIR KNOWN HOSTS

The following host list is based only upon reared parasite material examined and identified during the present revision. It is impossible to be certain that the host data accompanying the tachinid material is based always on correct identification of the host, but many of the hosts are well-known and widespread lepidopterous pests and the correctness of the host identifications is here assumed (in the absence of any way of checking them). All Oriental species of *Palexorista* are listed (together with synonyms so as to provide a check-list of names), but no hosts are yet known for some species. The known hosts are all in the Lepidoptera, and the host nomenclature is that currently valid; the localities of origin of reared specimens are shown for extra-limital material as well as that from the Oriental Region proper.

Palexorista bancrofti sp. n.

unidentified Pyralid. QUEENSLAND

Palexorista bisetosa (Baranov, 1932)

[Unknown]

Palexorista curvipalpis (Wulp, 1893)

unisetosa (Baranov, 1932) syn. n.

Suana concolor (Walker) (Lasiocampidae). CEYLON

Hippotion celerio (L.) (Sphingidae). NEW BRITAIN

unidentified Sphingids. CEYLON, QUEENSLAND

Palexorista deducens (Walker, 1860)

[Unknown]

- Palexorista dilaticornis* (Mesnil, 1951)
unidentified Geometrid. INDIA
- Palexorista immersa* (Walker, 1860)
latiforceps (Baranov, 1932) syn. n.
[Unknown]
- Palexorista inconspicuoides* (Baranov, 1932)
[Unknown]
- Palexorista laetifica* (Mesnil, 1951)
Eterusia cingala Moore (Zygaenidae). CEYLON
- Palexorista laxa* (Curran, 1927)
Heliothis armigera (Hübner) (Noctuidae). TANZANIA, RHODESIA,
SOUTH AFRICA, INDIA
- Palexorista lucagus* (Walker, 1849)
Spodoptera mauritia (Boisduval) (Noctuidae). INDIA
Spodoptera sp. (Noctuidae). THAILAND, MALAYA
Cretonotos gangis (L.) (Arctiidae). WEST PAKISTAN
Lymantria sp. (Lymantriidae). INDIA
- Palexorista munda* (Wiedemann, 1830)
Hippotion sp. (Sphingidae). INDIA
- Palexorista ophirica* (Walker, 1857)
Hulodes caranea (Cramer) (Noctuidae). MALAYA
- Palexorista painei* (Baranov, 1934)
Tirathaba rufivena Walker (Pyralidae : Pyraustinae). JAVA
- Palexorista parachrysoys* (Bezzi, 1925)
Etiella zinckenella (Treitschke) (Pyralidae : Phycitinae). SENEGAL
Psara bipunctalis (Fabricius) (Pyralidae : Pyraustinae). MALAYA
Pyrausta machoeralis (Walker) (Pyralidae : Pyraustinae). INDIA
Eublemma sp. (Noctuidae). INDIA
- Palexorista reclinata* sp. n.
[Unknown]
- Palexorista solennis* (Walker, 1859)
succini (Giebel, 1862)
latestriata (Wulp, 1881) syn. n.
discreta (Wulp, 1893) syn. n.
profana (Townsend, 1927)
inconspicuella (Baranov, 1932) syn. n.
imperfecta (Malloch, 1935) syn. n.
Crocidolomia binotalis Zeller (Pyralidae : Pyraustinae). CEYLON, JAVA
Enchocnemidia vertumnalis (Guenée) (Pyralidae : Pyraustinae). GUAM
Ostrinia nubilalis (Hübner) (Pyralidae : Pyraustinae). WEST IRIAN
(INDONESIAN NEW GUINEA)
Homona sp. (Tortricidae). WEST IRIAN (INDONESIAN NEW GUINEA)
Cosmophila sp. (Noctuidae). INDIA

Hyblaea puera (Cramer) (Noctuidae). INDIA, BURMA

Amathusia phidippus (L.) (Amathusiidae). MALAYA

Palexorista sororcula (Mesnil, 1949)

[Unknown]

Palexorista subanajama (Townsend, 1927)

Acantholeucania loreyi (Duponchel) (Noctuidae). QUEENSLAND

Polydesma umbricola Boisduval (Noctuidae). NEW BRITAIN

Tiracola plagiata (Walker) (Noctuidae). MALAYA, NEW GUINEA

Palexorista summaria (Townsend, 1927)

[Unknown]

Palexorista sp. (?*P. ophirica* (Walker)) (2 ♀)

Setora nitens Walker (Limacodidae). MALAYA

Palexorista sp. (nr. *aequalis* (Malloch))

Acantholeucania loreyi (Duponchel) (Noctuidae). FIJI

Pseudaletia separata (Walker) (Noctuidae). FIJI

Palexorista sp.

Doratifera casta Scott (Limacodidae). NEW SOUTH WALES

Palexorista sp.

Persectania ewingii (Westwood) (Noctuidae). SOUTH AUSTRALIA

Palexorista sp.

unidentified Saturniid. NEW GUINEA

REVIEW OF LITERATURE HOST RECORDS OF ORIENTAL SPECIES OF *PALEXORISTA*

The literature of agricultural and forest entomology in the Oriental and Australasian Regions contains many records of the hosts of the species of *Palexorista* occurring in the Oriental Region. The present revisionary work has shown that the records were often based on identifications of the Tachinid parasites now known to be faulty, and the object of the present review is to bring together all the host records in the literature with an indication of their validity. That the hosts themselves were correctly identified is assumed in the absence of material associated with the parasites, and, with this proviso, the validity of the records is classified as follows:

- (a) Correct: parasite material seen on which the record based and found to be correctly identified.
- (b) Probably valid: no parasite material seen on which the record is based but the parasite identification almost certainly correct.
- (c) Very suspect: no parasite material seen on which the record is based but the parasite almost certainly misidentified (judging mainly from present knowledge of geographical distribution of the parasite).
- (d) Erroneous: parasite material seen on which the record is based and found to be misidentified (in these cases the correct identification is shown where possible in the review table below).

In the tabulation of the host records that follows, the names of the Tachinid parasites are given alphabetically according to the binomen used in the reference cited: most species were cited in combination with *Sturmia* Robineau-Desvoidy. Authors' names for both parasite and host are omitted for simplicity, but currently valid names of the Lepidoptera cited are shown in square brackets to relate the host names to contemporary literature (the record of *Hypaetra remosa* Hbn. as host of *Crossocosmia curvipalpis* Wulp by Wulp (1893) is omitted as Lepidoptera specialists have been unable to trace a *remosa* of Hübner under this or any similar spelling).

The host-parasite catalogue of Thompson (1944-47, 1951) is a compilation from the literature and is not cited in the table except in cases where it provides the first published records of parasite-host associations. Also omitted, since they are taken from Thompson's catalogue, are the records of host names given by Mesnil (1951: 181-196) except for those relating to new Oriental species of *Pallexorista* there described.

Parasite name	Host name	Reference	Locality	Validity
<i>Blepharipoda lucagus</i>	<i>Creatonotus gangis</i>	Husain & Mathur (1924)	Punjab	Correct
<i>Blepharipoda ophirica</i>	<i>Tiracola plagiata</i>	Corbett & Miller (1928), Corbett & Miller (1933), Greenstreet & Lambourne (1933)	Malaya	Erroneous (relates to <i>subanajama</i>)
<i>Crossocosmia discreta</i>	<i>Godara comalis</i> [<i>Crocidolomia binotalis</i>]	Wulp (1893)	Java	Correct
<i>Drino dilaticornis</i>	Geometrid. (unident.)	Mesnil (1951)	India	Correct
<i>Drino laetifica</i>	<i>Heterusia cingala</i> [<i>Eterusia cingala</i>]	Mesnil (1951)	Ceylon	Correct
<i>Sturmia aequalis</i>	<i>Prodenia litura</i> [<i>Spodoptera litura</i>]	Hoyt (1955)	Samoa	Probably valid
<i>Sturmia bimaculata</i>	<i>Cirphis loreyi</i> [<i>Acantholeucania loreyi</i>]	Veitch (1919)	Fiji	Erroneous
	<i>Cirphis unipuncta</i> [<i>Pseudaletia unipuncta</i>]	Veitch (1919)	Fiji	Erroneous
	<i>Cirphis</i> sp.	Lever (1941)	Fiji	Erroneous
<i>Sturmia inconspicua</i>	<i>Amathusia phidippus</i>	Corbett & Miller (1928, 1933)	Malaya	Erroneous (relates to <i>solennis</i>)
	<i>Tiracola plagiata</i>	Corbett & Miller (1928, 1933), Greenstreet & Lambourne (1933)	Malaya	Erroneous (relates to <i>subanajama</i>)
<i>Sturmia inconspicuella</i>	<i>Cirphis loreyi</i> [<i>Acantholeucania loreyi</i>]	Bell (1939)	Queensland	Probably valid
	<i>Diacrisia obliqua</i>	Thompson (1945, 1951)	India	Very suspect

Parasite name	Host name	Reference	Locality	Validity
<i>Hapalia machaeralis</i> [<i>Pyrausta machoeralis</i>]		Beeson & Chatterjee (1935), Beeson & Chatterjee (1939), Beeson (1938)	India	Probably valid
		Garthwaite & Desai (1939), Braithwaite (1941)	Burma	Probably valid
<i>Hyblaea puera</i>		Beeson & Chatterjee (1935), Beeson (1938), Beeson & Chatterjee (1939)	India	Correct
		Garthwaite & Desai (1939), Braithwaite (1941)	Burma	Correct
<i>Margaronia laticostalis</i> [<i>Palpita laticostalis</i>]		Beeson & Chatterjee (1935), Beeson (1938), Beeson & Chatterjee (1939), Garthwaite & Desai (1939)	India	Probably valid
<i>Prodenia litura</i> [<i>Spodoptera litura</i>]		Lever (1943)	Fiji	Very suspect
<i>Rhyacia ipsilon</i> [<i>Agrotis ipsilon</i>]		Franssen (1935)	Celebes	Probably valid
<i>Spodoptera mauritia</i>		Beeson & Chatterjee (1935), Garthwaite & Desai (1939)	India	Probably valid
<i>Telicota palmarum</i> [<i>Cephrenes augiades</i>]		Corbett & Miller (1933)	Malaya	Very suspect
<i>Sturmia inconspicuoidea</i>	<i>Acherontia styx</i>	Thompson, (1944, 1951)	India	Very suspect
	<i>Amsacta</i> sp.	Thompson (1944, 1951)	India	Very suspect
	<i>Cirphis albistigma</i> [<i>Leucania albistigma</i>]	Cherian & Anantanarayanan (1941)	India	Very suspect
	<i>Cirphis loreyi</i> [<i>Acantholeucania loreyi</i>]	Bell (1938)	Queensland	Very suspect (almost certainly <i>subanajama</i>)
	<i>Cirphis</i> spp.	Bell (1936)	Queensland	Very suspect (almost certainly <i>subanajama</i>)

<i>Crocidolomia binotalis</i>		Baranov (1936)	New Britain	Very suspect
<i>Dasychira grossa</i>		Corbett & Miller (1933)	Malaya	Very suspect
Geometrid. (unident.)		Beeson & Chatterjee (1935)	India	Very suspect
<i>Hidari irava</i>		Tjien Mo (1939)	Java	Very suspect
<i>Hulodes caranea</i>		Corbett & Miller (1933)	Malaya	Erroneous (relates to <i>ophirica</i>)
<i>Hyblaea puera</i>		Garthwaite & Desai (1939)	Burma	Very suspect
<i>Laphygma exigua</i> [<i>Spodoptera exigua</i>]		Cherian (1937), Cherian & Kylasam (1939)	India	Very suspect
<i>Mahasena corbetti</i>		Corbett (1937)	Malaya	Very suspect
<i>Prodenia litura</i> [<i>Spodoptera litura</i>]		Corbett & Miller (1933) Lever (1935)	Malaya Solomon Islands	Very suspect Very suspect
<i>Spodoptera exempta</i>		Bell (1937)	Queensland	Very suspect
<i>Spodoptera mauritia</i>		Corbett & Miller (1933), Corbett (1937)	Malaya	Very suspect (almost certainly <i>lucagus</i>)
<i>Tiracola plagiata</i>		Corbett & Miller (1933)	Malaya	Erroneous (relates to <i>subanajama</i>)
<i>Sturmia painei</i>	<i>Tirathaba</i> sp.	Baranov (1934b)	Java	Correct
	<i>Tirathaba rufivena</i>	Paine (1935)	Java	Correct
<i>Sturmia parachrysoψs</i>	<i>Acharana mutualis</i> [<i>Psara bipunctalis</i>]	Beeson (1938)	India	Correct
	<i>Eublemma</i> sp.	Thompson (1945, 1951)	India	Correct
	<i>Hapalia machaeralis</i> [<i>Pyrausta machoeralis</i>]	Beeson & Chatterjee (1935), Beeson (1938), Beeson & Chatterjee (1939)	India	Correct
	<i>Psara bipunctalis</i>	Bezzi (1925), Corbett & Miller (1928, 1933)	Malaya	Correct
	<i>Leucinodes</i> sp.	Thompson (1946, 1951)	India	Very suspect

NOTES ON MIDDLE EASTERN SPECIES OF *PALEXORISTA*

Two species of *Palexorista* that occur in the Middle East, *P. imberbis* (Wiedemann) and *P. zonata* (Curran), are very closely allied to some species—particularly *P. laxa* (Curran) and *P. munda* (Wiedemann)—that occur in the Oriental Region, and it has been necessary to study these forms from the Middle East in the course of the present revision in order to determine their identity; this was especially necessary in the case of *P. imberbis* (Wiedemann), since Mesnil (1949, 1951) has cited this name as a senior synonym of *laxa*. The conclusions from the present study, based on male genitalia as well as other characters, are that *P. imberbis* (Wiedemann), *P. laxa* (Curran), *P. zonata* (Curran) and *P. munda* (Wiedemann) are distinct, although very closely allied, species and that *laxa* is certainly not synonymous with *imberbis* as the latter is currently understood. The following notes on *P. imberbis* and *P. zonata*, and the accompanying figures of the male genitalia of these species, are here given so as to assist in the recognition of these species and to distinguish them from related species in Africa and the Oriental Region.

Palexorista imberbis (Wiedemann, 1830)

Tachina imberbis Wiedemann, 1830 : 317. Syntypes ♂, EGYPT. (Whereabouts not confirmed: see below).
Palexorista imberbis (Wiedemann) Crosskey, 1966 : 136.

The original type-material of *imberbis* evidently consisted of at least two male syntypes, since at the end of the original description Wiedemann cited the depositories as "Im Berliner Museum und in Professor Lehmann's Sammlung in Hamburg". I have been unable to ascertain whether any syntype now exists: it is presumed that the one formerly in Hamburg is destroyed, and Dr. Schumann informs me that the Tachinid collection in Berlin Museum is in such need of curation that it is impossible to trace a possible type existing in it at the present time. Two species of *Palexorista*, so far as is known at present, occur in Egypt, the type-locality of *imberbis*; one species has the frons relatively narrow, has narrow parafacials, and has the head pollinosity slightly yellowish, and the other has an unusually broad frons, very wide parafacials and the head pollinosity entirely greyish white. The name *zonata* undoubtedly applies to the former species with narrow frons, and the name *imberbis* is accepted as applying to the latter species with broad frons (in accordance with the usage of Mesnil, 1949, 1951). The character of the wide frons and vertex in *imberbis* led Mesnil (1949) to place the name *laxa* in synonymy with *imberbis*, since *laxa* also shows an unusually wide frons and many other characters almost identical with those of *imberbis*: however the male genitalia are different in the two forms (although both lack stubby spinules on the paralobes), since the mesolobes in *imberbis* from Egypt are much more slender and tapering in profile than those of *laxa* (cf. Text-figs. 74 and 44), and the paralobes in *imberbis* are conspicuously wider than those in *laxa*. The antennae of *imberbis* from Egypt are shorter than those of *laxa*, the third antennal segment of the male in the former species measuring 2.0–2.2 times as great as the second segment, and the third segment in the male of *laxa* measuring 2.6–3.0 times the length of the second segment.

P. imberbis is easily distinguished from *P. zonata* by the absence of stubby spinules on the male paralobes (*cf.* Text-figs. 74 and 75) and by the broad frons.

♂♀. Antennal axis well above ocular axis, frontal length in ♂ about 1.13 times as great as facial length. Occiput without black occipital setulae behind postocular row. Vertex 0.31–0.33 of head-width in ♂, about 0.33 of head-width in ♀. Head pollinosity entirely white or greyish white. Third antennal segment in ♂ about 2.0–2.2 times as long as second segment. Parafacial exceptionally wide, in ♂ almost twice as wide as third antennal segment. Parafacials haired on about upper half in ♂ and upper two-fifths in ♀. Abdomen slightly reddish basally, dorsal hair of T₄ in about six or seven series, ♂ hair-patches large. ♂ genitalia with bifurcate aedeagus very similar to that of *laxa* (Text-fig. 29), paralobes rather broad and without stubby black spinules (apical parts of paralobes with long hairs), mesolobes much narrower than paralobes and in profile rather straight and evenly tapering (Text-fig. 74), mesolobes in posterior view long and very slender (Text-fig. 72).

Material examined. No type-material seen.

Other material. EGYPT: 2 ♂, 1 ♀, Meadi, on large sun moth, 20.vii.1912 (*F. H. G.*) (B.M. Nat. Hist.); 1 ♂, bred from large sun moth larva, *Taragama acaciae*, 27.vi.1910 (*P. Willcocks*) (B.M. Nat. Hist.).

Palexorista zonata (Curran, 1927)

Sturmia zonata Curran, 1927 : 336. Holotype ♂, UGANDA. In British Museum (Natural History), London. [Examined]

Palexorista zonata (Curran) Crosskey, 1966 : 136.

This species occurs widely in East Africa, whence its range extends northwards and north-eastwards to the Sudan, Egypt and Arabia. It differs from both *P. imberbis* and *P. laxa* in having a much narrower frons and vertex, and in notable differences in the male genitalia, particularly in the presence of stubby black spinules on the apical parts of the paralobes (Text-fig. 75). A characteristic feature of the male genitalia of *P. zonata* is the curvature of the mesolobes: seen in profile these are distinctly convex on the posterior edge (Text-fig. 75). The curved shape of the mesolobes in lateral view assists in distinguishing *P. zonata* from *P. munda* (Wiedemann), an Oriental species very closely related to *zonata* and showing a generally very similar male hypopygium (*cf.* Text-figs. 40 and 75): the paralobes of the male genitalia of both *zonata* and *munda* have similar black spinules and are in shape much alike, and the mesolobes seen in posterior view are almost indistinguishable (*cf.* Text-figs. 57 and 73). The longer antennae of *zonata* (third segment in ♂ 2.8–3.3 times as long as second segment) provide a character separating this species from *munda* (third segment in ♂ 2.4–2.6 times as long as second segment), and this character taken together with the differently shaped mesolobes suggest that *munda* and *zonata* are best treated as distinct species: later work, when material is available from intermediate geographical areas, may indicate that only a single variable species is involved.

♂♀. Antennal axis well above ocular axis, frontal length in ♂ about 1.10 times as great as facial length. Occiput without black setulae behind postocular row. Vertex 0.27–0.29 of head-width in ♂, 0.31–0.34 of head width in ♀. Head pollinosity usually yellowish white on

facial regions, usually pale yellowish grey to brassy yellowish on parafrontals; parafrontals sometimes entirely greyish and face whitish. Third antennal segment in ♂ 2.8–3.3 times as long as second segment, in ♀ 2.5–2.6 times as long as second segment. Parafrontals narrow, only slightly wider than or subequal in width to third antennal segment, haired on uppermost third or two-fifths. Abdomen hardly at all reddish anterolaterally, dorsal hair of T₄ in about seven or eight series, ♂ hair-patches large. ♂ genitalia with bifurcate aedeagus, paralobes apically with stubby black spinules and slightly angulate in lateral view (Text-fig. 75), mesolobes in profile with distinctive slightly convex posterior margin (Text-fig. 75) and in posterior view with acuminate apices (Text-fig. 73).

Material examined. Holotype ♂. UGANDA: Entebbe, 4.vi.1914 (*C. C. Gowdey*).

Paratypes. UGANDA: 1 ♀, data as for holotype (B.M. Nat. Hist.); 1 ♂, Entebbe, 8.vii.1914 (*C. C. Gowdey*) (B.M. Nat. Hist.); 1 ♀, Kampala, 8.viii.1914 (*C. C. Gowdey*) (B.M. Nat. Hist.).

Other material. EGYPT: 6 ♂, 9 ♀, Esbet el Nakhl, bred ex pupae of small sunt moth *Nadiasa obsoleta* Klug, xi.1909 (*F. C. Willcocks*). SUDAN: 1 ♂, Kodroko, 10.iv.1913 (*H. H. King*); 1 ♂, 1 ♀, Khandak, 5.i.1915 (*H. H. King*). KENYA: 2 ♂, Kiambu, ex *Spodoptera exempta*, 12–17.vii.1963 (*E. S. Brown*). ARABIA: 4 ♂, 2 ♀, Jedda, ex *Celerio livornica*, ii.1946 (*R. E. Ellison*).

All above-listed material in British Museum (Natural History).

Palexorista sp.

The British Museum collection contains a few specimens of an unidentified species of *Palexorista*, possibly new, from Aden and Cyprus: attention is drawn here to these specimens as it is possible that the same species may occur in the Oriental Region or in Africa. The species concerned has the bifurcate type of aedeagus, large hair-patches on the male abdomen, the antennal axis far above the ocular axis, and lacks black setulae behind the postocular row; these characters indicate that it is closely allied to *P. imberbis* and *P. zonata*, but it differs from these and related species in having exceptionally long and very slender paralobes in the male genitalia. The paralobes bear a few strong spinules at the extreme tips. The data of the specimens seen are as follows:

ADEN: 1 ♂, 1 ♀, S. Othman, 17.iii.1895 (*C. G. Nurse*); 1 ♂, 1 ♀, Aden, 5 and 18.iii.1895 (*C. G. Nurse*). CYPRUS: 2 ♂, ex *Laphygma exigua* Hb., 3.x.1924 (*D. S. Wilkinson*).

ACKNOWLEDGMENTS

I have much pleasure in thanking the following specialists for their kindness in lending me types and other material from their respective Museum collections: Mr. Willem Ellis (Amsterdam); Mr. V. S. van der Goot (formerly at Leiden); Dr. J. L. Gressitt (Honolulu); Dr. G. Morge (Berlin-Eberswalde); Dr. S. L. Tuxen (Copenhagen); and Dr. D. M. Wood (Ottawa). I am most grateful also to Dr. Curtis Sabrosky (Washington) for much helpful information on material in Baranov's collection, now at the United States National Museum, and to Dr. L. P. Mesnil for making available to me certain types previously on loan to him from the Deutsches Entomologisches Institut.

REFERENCES

- AUSTEN, E. E. 1907. The synonymy and generic position of certain species of Muscidae (sens. lat.) in the collection of the British Museum, described by the late Francis Walker. *Ann. Mag. nat. Hist.* (7) **19** : 326-347.
- BARANOV, N. 1932. Zur Kenntnis der formosanischen Sturmien (Dipt. Larvaevor.). *Neue Beitr. syst. Insektenk.* **5** : 70-82.
- 1934a. Zur Kenntnis der parasitären Raupenfliegen der Salomonen, Neubritanniens, der Admiralitäts-Inseln, der Fidschi-Inseln und Neukaledoniens, nebst einer Bestimmungstabelle der orientalischen Sturmia-Arten. *Vet. Arh.* **4** : 472-485.
- 1934b. Mitteilungen über gezüchtete orientalische Larvaevoriden. (Insecta, Diptera). *Ent. Nachr.* **8** : 41-49.
- 1936. Weitere Beiträge zur Kenntnis der parasitären Raupenfliegen (Tachinidae = Larvaevoridae) von den Salomonen und Neubritannien. *Ann. Mag. nat. Hist.* (10) **17** : 97-113.
- BEESON, C. F. C. 1938. Undergrowth and biological control of teak defoliators. *Indian Forester* **64** : 485-492.
- BEESON, C. F. C. & CHATTERJEE, S. N. 1935. On the biology of the Tachinidae (Diptera). *Indian Forest Rec. (Entom.)* **1** : 169-184.
- 1939. Further notes on the biology of parasites of teak defoliators in India. *Indian Forest Rec. (Entom.)*, **5** : 357-379.
- BELL, A. F. 1936. Report of the Division of Entomology and Pathology. In *Rep. Bur. Sug. Exp. Stns Qd* **36** : 19-27.
- 1937. Division of Entomology and Pathology. In *Rep. Bur. Sug. Exp. Stns Qd* **37** : 34-41.
- 1938. Report of the Division of Entomology and Pathology. In *Rep. Bur. Sug. Exp. Stns Qd* **38** : 41-50.
- 1939. Report of the Division of Entomology and Pathology. In *Rep. Bur. Sug. Exp. Stns Qd* **39** : 45-59.
- BEZZI, M. 1925. Some Tachinidae (Dipt.) of economic importance from the Federated Malay States. *Bull. ent. Res.* **16** : 113-123.
- BIGOT, J. M. F. 1892. Catalogue of the Diptera of the Oriental Region. Part III. *J. Asiat. Soc. Beng.* **61** : 178-236.
- BRAITHWAITE, J. D. 1941. Part III—Entomological Research. In *Rep. wkg Plans Silv. Ent. Burma 1939-40* : 99-113.
- CHERIAN, M. C. 1937. Administration Report of the Government Entomologist, Coimbatore, for 1936-37. *Rep. Dep. Agric. Madras 1936-37* : 126-133. [Not seen : cited from *Rev. appl. Ent. A*, **26** : 55]
- CHERIAN, M. C. & ANANTANARAYANAN, K. P. 1941. *Cirphis albistigma* H.—A pest of grasses in South India. *J. Bombay nat. Hist. Soc.* **42** : 611-616.
- CHERIAN, M. C. & KYLASAM, M. S. 1939. Studies on *Laphygma exigua* Hb. and its natural enemies. *J. Bombay nat. Hist. Soc.* **41** : 253-260.
- CORBETT, G. H. 1933. A list of insects with their parasites and predators in Malaya. *Scient. Ser. Dep. Agric. Straits Settl. F.M.S.* No. 13 : 15 pp.
- 1937. Division of Entomology: Annual Report for the year 1936. *Gen. Ser. Dep. Agric. Straits Settl.* No. 26 : 29-48.
- CORBETT, G. H. & MILLER, N. C. E. 1928. A list of insects with their parasites and predators in Malaya. *Malay. agric. J.* **16** : 404-424.
- CROSSKEY, R. W. 1963. The identity of *Tachina convergens* Wiedemann, 1824 and *Tachina munda* Wiedemann, 1830 (Diptera: Tachinidae). *Ann. Mag. nat. Hist.* (13) **6** : 77-83.
- 1966. The putative fossil genus *Palexorista* Townsend and its identity with *Prosturmia* Townsend (Diptera: Tachinidae). *Proc. R. ent. Soc. Lond.* (B) **35** : 133-137.
- CURRAN, C. H. 1927. Studies in African Tachinidae (Diptera). *Bull. ent. Res.* **17** : 319-340.
- FRANSSSEN, C. J. H. 1935. De biologie van de zwartbruine aardrups (*Rhyacia ipsilon* Hufn.) en haar biologische bestrijding in het Sengkansche Merengebied (Zuid-Celebes). *Landbouw, Buitenz.* **10** : 109-137.

- GARTHWAITE, P. F. & DESAI, M. H. 1939. On the biology of the parasites of the teak defoliators, *Hapalia machaeralis* Walk. (Pyralidae) and *Hyblaea puera* Cram. (Hyblaeidae) in Burma. *Indian Forest Rec. (Entom.)* **5** : 309-353.
- GIEBEL, C. 1862. Wirbelthier und Insektenreste im Bernstein. *Z. ges. Naturw. Berl.* **1862** : 311-321.
- GREENSTREET, V. R. & LAMBOURNE, J. 1933. Tapioca in Malaya. *Gen. Ser. Dep. Agric. Straits Settl.* No. 13 : 76 pp.
- HOYT, C. P. 1955. Notes on Larvaevorid flies reared from *Prodenia litura* Fab. and *Othreis fullonia* (Clerck) larvae in American Samoa. *Proc. Hawaii. ent. Soc.* **15** : 419-421.
- HUSAIN, M. A. & MATHUR, U. B. 1924. A preliminary list of parasites of economic importance bred in the Punjab. *Rep. Proc. ent. Meet. Pusa* **5** : 119-121.
- JACK, R. W. 1935. Report of the Chief Entomologist for the year ending 31st December, 1934. *Rhodesia agric. J.* **32** : 558-581.
- LEVER, R. J. A. W. 1935. Some insect pests of local economic plants. *Agric. Gaz. Br. Solomon Isl.* **3**, No. 3 : 3-5.
- 1941. Entomological notes. *Agric. J. Dep. Agric. Fiji* **12** : 45-50.
- 1943. Division of Entomology. Annual Report for 1942. *Agric. J. Dep. Agric. Fiji* **14** : 83-85.
- MALLOCH, J. R. 1935. Phoridae, Agromyzidae, Micropezidae, Tachinidae and Sarcophagidae (Supplement). *Insects of Samoa*, **6**. Diptera, fasc. 9 : 329-366. London.
- MESNIL, L. P. 1944-65. In Lindner, *Fliegen palaearkt. Reg.* **64g** : 1-879.
- 1949. Essai de révision des espèces du genre *Drino* Robineau-Desvoidy Sturmiinae à oeufes macrotypes. *Bull. Inst. r. Sci. nat. Belg.* **25** (42), 38 pp.
- 1951. In Lindner, *Fliegen palaearkt. Reg.* **64g** : 161-208.
- 1952. In Lindner, *Fliegen palaearkt. Reg.* **64g** : 209-256.
- PAINE, R. W. 1935. The control of the coconut spike moth (*Tirathaba trichogramma*, Meyr.) in Fiji. *Bull. Dep. Agric. Fiji*, No. 18, 30 pp.
- THOMPSON, W. R. 1944-47. Section 1, Parasite Host Catalogue: Parts 5-9, Parasites of the Lepidoptera. *Cat. Parasites Predat. Insect Pests*, Belleville, Canada.
- 1951. Section 2, Host Parasite Catalogue: Part 1, Hosts of the Coleoptera and Diptera. *Cat. Parasites Predat. Insect Pests*, Belleville, Canada.
- TJIE MO, TJOA 1939. Aanteekeningen over de parasieten van *Hidari irava* in verband met de oecologie dezer plaag. *Landbouw, Buitenz.* **15** : 493-509.
- TOWNSEND, C. H. T. 1921. Some new muscoid genera ancient and recent. *Insector Inscit. menstr.* **9** : 132-134.
- 1927. Fauna sumatrensis. Diptera Muscoidea III. *Supplta ent.* **16** : 56-76.
- 1934-42. *Manual of Myiology*, 12 parts. São Paulo.
- VEITCH, R. 1919. Notes on the more important insects in sugar-cane plantations in Fiji. *Bull. ent. Res.* **10** : 21-39.
- WALKER, F. 1849. *List of the specimens of dipterous insects in the collection of the British Museum* **4** : 689-1172.
- 1857. Catalogue of the dipterous insects collected at Singapore and Malacca by Mr. A. R. Wallace, with descriptions of new species. *J. Proc. Linn. Soc. Lond.* **1** : 4-39.
- 1859. Catalogue of the dipterous insects collected in the Aru Islands by Mr. A. R. Wallace, with descriptions of new species. *J. Proc. Linn. Soc. Lond.* **3** : 77-131.
- 1860. Catalogue of the dipterous insects collected at Makassar in Celebes, by Mr. A. R. Wallace; with descriptions of new species. *J. Proc. Linn. Soc. Lond.* **4** : 90-172.
- WIEDEMANN, C. R. W. 1830. *Aussereuropäische zweiflügelige Insekten.* **2**. 684 pp. Hamm.
- WULP, F. M. VAN DER. 1881. *Diptera medegebracht door de Sumatra-expeditie.* 60 pp., Leiden.
- 1893. Eenige Javaansche Tachininen. *Tijdschr. Ent.* **36** : 159-188.
- 1894. Parasitic Muscidae from British India. *Indian Mus. Notes* **3**, No. 5 : 8-17.
- 1896. *Catalogue of the described Diptera from South Asia.* 219 pp., The Hague.

